

No. 2015-1547

United States Court of Appeals for the Federal Circuit

TRADING TECHNOLOGIES INTERNATIONAL, INC.,
Plaintiff-Appellant,

v.

OPEN E CRY, LLC, OPTIONSPRESS HOLDINGS, INC., ROSENTHAL COLLINS
GROUP, LLC, TRADESTATION SECURITIES, INC., TRADESTATION GROUP,
INC., IBG, LLC, TD AMERITRADE, INC., TD AMERITRADE HOLDING CORP.,
THINKORSWIM GROUP, INC., INTERACTIVE BROKERS, LLC, CQG, INC.,
CQGT, LLC, FUTUREPATH TRADING LLC, SUNGARD DATA SYSTEMS, INC.,
SUNGARD INVESTMENT VENTURES LLC, GL TRADE AMERICAS, INC.,
STELLAR TRADING SYSTEMS, LTD., STELLAR TRADING SYSTEMS, INC.,
ESPEED MARKETS, LP, BGC CAPITAL MARKETS, LP, ECCOWARE LTD.,
CUNNINGHAM TRADING SYSTEMS, LLC, CUNNINGHAM COMMODITIES,
LLC,

Defendant-Appellees,

AND

TRADEHELM, INC.,

Defendant.

Appeal from the United States District Court for the Northern District of Illinois in
consolidated case no. 10-cv-0715, Judge Virginia M. Kendall

OPENING BRIEF OF PLAINTIFF-APPELLANT TRADING TECHNOLOGIES INTERNATIONAL, INC.

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Form 9

FORM 9. Certificate of Interest**UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT**Trading Technologies v. Open E Cry, LLC et al.No. 2015-1547**CERTIFICATE OF INTEREST**

Counsel for the (petitioner) (appellant) (respondent) (appellee) (amicus) (name of party) appellant certifies the following (use "None" if applicable; use extra sheets if necessary):

1. The full name of every party or amicus represented by me is:

Trading Technologies International, Inc.

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

See response to number 1.

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

None

4. ☒ The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

McDonnell Boehnen Hulbert & Berghoff LLP: Leif R. Sigmond, Jr., Alan Wayne Krantz, Andrea Kay Orth, Ann C. Palma, Brandon J. Kennedy, Christopher D. Butts, Cole Bradley Richter, Jennifer M. Kurcz, Kristen L. Thomson, Marcus Jay Thymian, Matthew J. Sampson, Michael David Gannon, Paul A. Kafadar, S. Richard Carden, Sarah Emily Fendrick, Trading Technologies International, Inc.: Steven F. Borsand

April 27, 2015

Date

/s/ Cole B. Richter

Signature of counsel

Cole B. Richter

Printed name of counsel

Please Note: All questions must be answered

cc: _____

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STATEMENT OF RELATED CASES

In 2008, this Court heard appeals involving U.S. Patent Nos. 6,722,132 (“the ‘132 patent”) and 6,766,304 (“the ‘304 patent”) in Case Nos. 2008-1392, -1393, and -1422 (“the *eSpeed* case”). On February 25, 2010, this Court (the panel consisting of Judges Rader, Lourie, and Clark) issued its opinion. *Trading Techs. Int’l, Inc. v. eSpeed, Inc.*, 595 F.3d 1340 (Fed. Cir. 2010) (“the *eSpeed* decision”). The ‘132 and ‘304 patents are being asserted in the consolidated cases in the district court from which this appeal is taken. However, the issues in the 2008 appeal are not relevant in the present appeal.

In 2011, this Court heard another appeal in the *eSpeed* case in Case No. 2011-1424 regarding the issue of jurisdiction and damages. On June 6, 2012, this Court (the panel consisting of Judges Rader, Lourie, and Wallach) issued its opinion. Again, the issues in that appeal are not relevant in the present appeal.

In 2013, this Court heard an appeal (Case No. 2012-1583) from the consolidated district court cases from which the present appeal is taken regarding issues of written description and prosecution history estoppel for U.S. Patent No. 7,685,055 (“the ‘055 patent”) and U.S. Patent No. 7,676,411 (“the ‘411 patent”). On August 30, 2013, this Court (the panel consisting of Judges Lourie, Plager, and Benson) issued its opinion reversing the district court’s entry of summary judgment of invalidity of the ‘411 (and related patents) and remanded the case

back to the district court for further proceedings. The Court also reversed the district court's summary judgment of invalidity for the '055 patent and found that the '055 claims are adequately supported, removing this defense from the case. The issues in that appeal are not relevant in the present appeal.

In addition to the consolidated cases in the district court from which this appeal is taken, the following cases are also currently pending at the district court:

- *Trading Technologies International, Inc. v. GL Trade SA et al.*, (N.D. Ill. 05 C 4120) (which involves the '132 and '304 patents); and

- *Trading Technologies International, Inc. v. CQG, et al.*, (N.D. Ill. 05 C 4811) (which involves the '132 and '304 patents). On February 24, 2015, the district court found that the '132 and '304 patents are not invalid under 35 U.S.C. § 101 and later, that the patents were not invalid under 35 U.S.C. § 112. A jury trial was conducted in February and March of 2015. The jury found the '132 and '304 patents infringed, and awarded damages. The district court is currently handling post-trial motions. This Court is presently considering an appeal from this case (Case No. 2015-1277) in which CQG, Inc. and CQGT, LLC – Appellees in the present appeal – are challenging the district court's denial of a stay pending Covered Business Method (“CBM”) Review of the '132 patent (even though the trial already occurred). That appeal is fully briefed and awaiting decision.

JURISDICTIONAL STATEMENT

The district court has and continues to have subject matter jurisdiction over this patent infringement action pursuant to 28 U.S.C. §§ 1331 and 1338(a). On March 25, 2015, the district court entered an order staying the consolidated cases pending CBM Reviews of a subset of the patents-in-suit by the United States Patent and Trademark Office (“USPTO”) that were filed by just one of the defendants. TT timely filed a notice of appeal on March 27, 2015.

This Court has appellate jurisdiction for this appeal pursuant to Section 18(b)(2) of the Leahy-Smith America Invents Act. 35 U.S.C. § 321; Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”). Specifically, Section 18(b)(2) permits a party to “take an immediate interlocutory appeal from a district court’s decision under paragraph (1). The United States Court of Appeals for the Federal Circuit shall review the district court’s decision to ensure consistent application of established precedent, and such review may be de novo.” *Id.* at § 18(b)(2).

STATEMENT OF THE ISSUES

Whether the district court erred in staying this case pending CBM review where (i) only a small subset of the sixteen asserted patents-in-suit are undergoing CBM review, (ii) twelve of the Appellees have ***not*** agreed to be bound by the statutory estoppel that applies to the CBM petitioner and, as a result, (iii) the factors enumerated in Section 18(b)(1) of the Leahy-Smith America Invents Act weigh heavily against a stay.

STATEMENT OF THE CASE

In 2010, TT brought separate patent infringement lawsuits against the Appellees, which were consolidated into one case. A3097. Prior to any fact discovery, Appellees moved for summary judgment that, *inter alia*, the ‘411 and U.S. Patent No. 7,533,056 (“the ‘056 patent”) were invalid under 35 U.S.C. § 112 ¶ 1 and that prosecution disclaimer and prosecution history estoppel apply to eight of the sixteen patents-in-suit. A5632-35, A14129, A14328-29, A14389-90. All discovery was stayed during consideration of this summary judgment motion. A6417-21.

In February 2012, the district court entered summary judgment invalidating certain of the asserted patents including the ‘411 patent and the ‘055 patent. A21486. The district court also entered summary judgment in favor of TT that the ‘056 patent meets the written description requirement of 35 U.S.C. § 112 ¶ 1. A21486. TT immediately appealed that ruling to this Court. A21735-36, A21929-31, A22305, A22328. There was no discovery permitted during the appeal.

In August 2013, this Court reversed the district court’s entry of summary judgment of invalidity of the ‘055 patent and actually ruled on the merits that the ‘055 claims had adequate written description support. The Court also reversed the district court’s entry of summary judgment of invalidity of the ‘411 and other patents at issue, and remanded the case for further proceedings on the underlying

merits of the written description issue. A22548-73. Upon remand, in February 2014, Appellees again moved for summary judgment of invalidity of the ‘411 patent, this time on the underlying merits of the written description issue, which Appellees contended was “dispositive.” A22580-81, A23331.

In April 2014, the district court denied Appellees’ second summary judgment motion and requested a schedule from the parties. A23506. However, in early May 2014, before a schedule was entered, TD filed petitions for CBM Review of a small subset of patents-in-suit, and moved the district court for a stay of the consolidated cases in their entirety pending CBM Review. A23653, A23743, A23830, A23915, A24002, A23547.

In December 2014, the USPTO instituted CBM Review proceedings on four of the five CBM petitions. A25951, A25977, A26006, A26030, A26054. In March 2015, the district court granted the motion to stay pending CBM Review. A1. This interlocutory appeal followed.

STATEMENT OF FACTS

I. THE PATENTS-IN-SUIT

There are sixteen patents-in-suit.¹ A8130-70, A8614-44, A10811-49, A7393-430, A6428-66, A8921-56, A10347-93. All of these patents are generally directed to graphical user interface (“GUI”) tools that can be used to trade electronically. A34. Although the individual claims of patents-in-suit are directed to different features of the GUIs accused of infringement, all sixteen patents-in-suit are asserted against the same accused products. A8130-70, A8614-44, A10811-49, A7393-430, A6428-66, A8921-56, A10347-93. Moreover, because the patents-in-suit are all directed to the same general subject matter (GUI tools that can be used to trade electronically), the universe of potential prior art is the same for all of the patents-in-suit (although the specific prior art issues for each patent are different).

Notably, two of the asserted patents – the ‘132 and ‘304 patents – have been tested and upheld repeatedly at the Patent and Trademark Office and in the courts. A24715. For example, these patents were subjected to two quality reviews by the

¹ The ‘132 patent (A34), the ‘304 patent (A12), the ‘056 patent (A59), the ‘055 patent (A114), the ‘411 patent (A92), U.S. Patent No. 7,702,566, U.S. Patent No. 7,412,416, U.S. Patent No. 7,212,999, U.S. Patent No. 7,567,929, U.S. Patent No. 7,693,768, U.S. Patent No. 7,725,382, U.S. Patent No. 7,783,556, U.S. Patent No. 7,813,996, U.S. Patent No. 7,904,374, U.S. Patent No. 7,680,724, and U.S. Patent No. 7,127,424.

USPTO under what was then referred to as the “second set of eyes” program.

A24763-809. In October 2007, in *Trading Technologies Int’l. Inc. v. eSpeed*, a jury found infringement and upheld the validity of the ‘132 and ‘304 patents.

A24715. And on appeal, this Court affirmed on all counts. *Trading Techs. Int’l, Inc.*, 595 F.3d 1340. After the *eSpeed* jury trial, these patents were the subject of *ex parte* reexamination proceedings. A24811-21, A24823-31. There, the USPTO again sustained the validity of the ‘132 and ‘304 patents over all the alleged prior art that was uncovered by a joint defense group through years of formal and informal discovery. *Id.* In 2010, Appellee GL filed a second request for reexamination of the ‘132 patent. A24833-57. Notably, the PTO refused to even institute this reexamination proceeding, despite the very low standard for institution at the time.² *Id.* GL appealed and the USPTO affirmed the refusal to institute after conducting a *de novo* review. A24872-90.

Most recently, in February 2015 the district court in *Trading Technologies Int’l. Inc. v. CQG, Inc.* concluded – after extensive briefing and a half-day hearing on the matter – that the claims of the ‘132 and ‘304 patents are directed to patent eligible subject matter under § 101. 2015 WL 774655, at *5 (N.D. Ill. Feb. 24, 2015). In particular, the court found that the claims are not directed to an abstract

² The standard for institution of an *inter partes* reexamination was “whether the petitioner raised a substantial new question of patentability.” A24836.

idea and, independently, claim an inventive concept sufficient to make them patent-eligible. *Id.* And in March 2015, following a three-week jury trial in the same case, a jury found infringement of the ‘132 and ‘304 patents. During trial, CQG did not even allege invalidity based on prior art. At the close of evidence, the district court granted in favor of TT judgment as a matter of law that the ‘132 and ‘304 patents were not invalid under 35 U.S.C. § 112 for lack of written description support.

II. APPELLEES’ STRATEGY OF PIECEMEAL LITIGATION AND DELAY, AND THEIR IMPROPER USE OF THE STAY PROVISION OF THE AIA TO FURTHER THAT STRATEGY

In 2010, TT brought separate lawsuits against several direct competitors of TT. These groups included: (1) “OEC”³; (2) “FuturePath”⁴; (3) “IBG”⁵; (4) “CQG”⁶; (5) “SunGard”⁷; (6) “TD”⁸; and (7) “Tradestation.”^{9 10} In each suit, TT

³ This group includes: Open E Cry, LLC and Optionsxpress Holdings, Inc. A7393-430.

⁴ This group includes: FuturePath Trading LLC. A8614-44.

⁵ This group includes: Interactive Brokers, LLC and IBG, LLC. A10811-49.

⁶ This group includes: CQG, Inc. and CQGT, LLC. A8130-70.

⁷ This group includes: SunGard Data Systems, Inc., SunGard Investment Ventures LLC, and GL Trade Americas, Inc. A6428-66.

⁸ This group includes: TD Ameritrade, Inc., TD Ameritrade Holding Corp., and thinkorswim Group, Inc. A10347-93.

⁹ This group includes: Tradestation Securities, Inc. and Tradestation Group, Inc. A8921-56.

¹⁰ TT also brought suit against several other parties that subsequently settled with TT, namely Rosenthal Collins Group, LLC (A21279-82); eSpeed Markets, L.P., BGC Capital Markets, L.P., Eccoware, Ltd., (A23356-58); Cunningham Trading

asserted some subset of the sixteen patents-in-suit, including the ‘304 patent, the ‘132 patent, the ‘056 patent, the ‘055 patent, and the ‘411 patent.

In February 2011 the district court consolidated the separate actions into a single case. A3097 (noting that “[s]ubstantial time and effort will be conserved by reassignment for discovery because the cases involve similar technology and reassignment would avoid inconsistent rulings for claim construction, invalidity, and infringement issues”). Shortly thereafter, and prior to engaging in any technical tutorial, any *Markman* proceedings, or even any discovery at all, Appellees moved for summary judgment that, *inter alia*, the ‘411 and the ‘056 patent were invalid under 35 U.S.C. § 112 ¶ 1.¹¹ A5632-35, A14129, A14328-29, A14389-90. Appellees requested that the district court stay all discovery during consideration of this summary judgment motion. A6263-84. The district court granted this stay. A6417-21.

Ultimately, in February 2012, the district court entered summary judgment invalidating certain patents, including the ‘411 patent and the ‘055 patent.¹² A21486. TT immediately appealed that ruling to this Court. A21735-36, A21929-

Systems, LLC, Cunningham Commodities, LLC (A3136); Tradehelm, Inc. (A5180-81, A26489); Stellar Trading Systems, Ltd., and Stellar Trading Systems, Inc. (A22486-542).

¹¹ TT cross-moved for summary judgment that the ‘056 patent meets the written description requirement of 35 U.S.C. 112 ¶ 1. A14937-38.

¹² The district court also entered summary judgment in favor of TT that the ‘056

31, A22305, A22328. At the outset of the appeal, the parties informed the district court that the case could proceed with respect to any patents not at issue in the appeal. A21735-48. However, the district court did not lift the stay and did not enter a case schedule. *See* A26470-72. Further, Appellees refused to engage in discovery during the appeal. *See id.*

In August 2013, this Court reversed the district court's entry of summary judgment of invalidity of TT's patents, including the '411 and '055 patents, and remanded the case for further proceedings on the underlying merits of written description issue for the '411 patent. A22548-73. This Court also ruled in TT's favor on the merits of the '055 written description issue. Upon remand, in February 2014, Appellees moved again for summary judgment of invalidity of the '411 patent, this time on the underlying merits of the written description issue. A22580-81. And again, Appellees asked the district court to stay all discovery pending disposition of that summary judgment motion. A23370-75, A23378-83, A23385-90, A23392-98. In support for staying all discovery, the Appellees contended that the '411 patent written description issue was an important issue because resolution thereof could greatly simplify the case, and impact two other of the asserted patents. *See id.*; A23331, A23500-02, A23371.

In April 2014, the district court denied Appellees second summary judgment

patent meets the written description requirement of 35 U.S.C. § 112 ¶ 1. A21486.

motion and requested a schedule from the parties. A23506. It was only then – after losing their request to yet again stay discovery pending resolution of the written description issue – that Appellee TD petitioned for CBM Review of just five¹³ of the fifteen patents TT asserted against TD and of the sixteen patents in the consolidated case.¹⁴ A23653, A23743, A23830, A23915, A24002.

Tellingly, in its CBM filing, TD did not even bother challenging the ‘411 patent based on the written description issue – an issue that it had just previously presented to the district court as being dispositive and worthy of special early attention. *See* A23907-94; A23331. On the other hand, TD did re-raise in their CBM petition for the ‘056 patent the identical written description issue that the district court *already rejected* on summary judgment. A23823-906. Moreover, the CBM petitions did not address any of the Appellees’ primary prior art references, so that if the CBM Review does not resolve in TD’s favor, TD can get another bite at the invalidity apple with the district court. *See* A23653, A23743, A23830, A23915, A24002; AIA § 18(a)(1)(D). All of this demonstrates that TD’s motive with the CBM filings was to simply engage in piecemeal litigation and

¹³ TD filed petitions for CBM Review of the ‘055, ‘056, ‘411, ‘132, and ‘304 patents.

¹⁴ The CBM Review program went into effect in September 2012 during the first appeal of these consolidated cases mentioned above. AIA § 18. However, TD did not avail itself of CBM Review of any of TT’s patents until after the district court denied TD’s renewed motion for summary judgment and further request to stay

delay this case.

After filing its CBM Petitions, TD (along with other Appellees) immediately moved for a stay of the consolidated cases in their entirety. A23547, A24648, A24708. Significantly, twelve of the Appellees have not agreed to be bound by the statutory estoppel that attaches to the actual petitioner, TD. *See* AIA § 18(a)(1)(D); *see also* A24657, A26716 (“the SunGard Defendants do not consent to be bound in any way by rulings on the CBM petitions filed by TD Ameritrade”). The district court entered a briefing schedule for the motions to stay, which the parties fully briefed by June 2014. *See* A25185-208, A25881-86. However, the district court did not enter a discovery schedule while it considered these motions. Ultimately, the district court did not rule on the motions to stay until nine months later, when in March 2015 it granted the Appellees’ motions to stay the consolidated cases in their entirety. A1. Thus, Appellees were awarded a *de facto* stay from the time this Court reversed the district court’s entry of summary judgment and remanded the case for further proceedings in August 2013.

In December 2014, the USPTO instituted CBM Review proceedings on four of the five CBM petitions. A25951, A25977, A26006, A26030, A26054.

Specifically the USPTO instituted CBM Review on: (1) the ‘132 patent on the single issue of whether the claims are directed to eligible subject matter under 35

discovery.

U.S.C. § 101 (A26006), (2) the ‘411 patent on the same single issue (A26030), (3) the ‘056 patent based on 35 U.S.C. §§ 101 and 103 grounds (A25973-74), and (4) the ‘055 patent based on 35 U.S.C. §§ 101 and 103 grounds (A26001-02).¹⁵ *Id.* The USPTO declined to institute CBM Review proceedings for the ‘304 patent. A26054. The USPTO also declined to institute on any of the prior art grounds raised with respect to the ‘132 and ‘411 patents. A26006, A26030.

Many of the patents-in-suit have been honored by companies over the years, with over twenty entities settling with TT, including competitors who have paid TT for past damages and royalties for an ongoing license under the patents-in-suit.

¹⁵ At the time of the PTAB’s CBM institution of review on § 101, the PTO and its procedures regarding how to address § 101 were in a state of flux. *See e.g.* 79 Fed. Reg. 74,618, 74,618-33 (Dec. 16, 2014) (2014 Interim Guidance on Patent Subject Matter Eligibility). This institution also came before this Court’s guidance on patent-eligibility issues in *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014). There, this Court held that claims that are “necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks” were indeed directed to patent-eligible subject matter. *Id.* at 1257. Tellingly, the district court in *Trading Technologies Int’l. Inc. v. CQG, Inc.* – armed with (and citing to) this guidance – held specifically that all claims of the ‘132 and ‘304 patents were directed to patent-eligible subject matter. 2015 WL 774655, at *4-5.

SUMMARY OF THE ARGUMENT

The district court erred by staying this case pending CBM Review. This case has been languishing in the courts for over five years with no end in sight. Indeed, no discovery has been taken nor has a trial date been set. Appellees, all competitors of TT, have done everything in their power to litigate this case in a piecemeal fashion and interject delay and further expense, including using the CBM program and its stay provision to further these goals. The factors enumerated in Section 18(b)(1) of the AIA weigh heavily against a stay, especially in view of a few crucial facts in this case. Indeed, the purpose of Section 18 was to provide for a speedier and cheaper resolution of issues. A24741 (stmt. of Sen. Schumer remarking that the CBM review program was “designed to provide a cheaper, *faster* alternative to district court litigation”). Appellees are using Section 18 in direct conflict with that purpose.

First, only four of the sixteen patents-in-suit are subject to CBM Review and, as a result, the CBM Review cannot possibly dispose of the entire litigation or even a significant portion of the litigation. A stay will not simplify issues or reduce the burden of litigation because all sixteen of the asserted patents relate to the same subject matter and are asserted against the same products. As such, full discovery on the issues of infringement, damages, and validity will proceed in the same manner– and with respect to the same accused products – even in the

unlikely event that four of the patents-in-suit are removed from the case.

Second, twelve of the Appellees have not agreed to be bound by the statutory estoppel that applies to the CBM petitioner. As such, there will be no simplification of issues because, if any of the CBM petitioner's arguments fail, then any (or all) of the other Appellees can simply re-litigate the same issues before the district court. This would actually increase the burden of litigation on the parties and the Court. It would also award Appellees a clear tactical advantage to the prejudice of TT by permitting, for example, multiple bites at the invalidity apple, serial attacks on the patents-in-suit, and continued delay of this case.

In sum, each of the relevant factors weighs against a stay. A stay of the present case under these circumstances does not simplify anything—it merely encourages abuse of the system to the advantage of Appellees.

ARGUMENT

I. STANDARD OF REVIEW

Prior to the AIA, this Court reviewed decisions on motions to stay pending USPTO proceedings under the abuse of discretion standard. *See Benefit Funding Sys. LLC v. Advance Am. Cash Advance Centers Inc.*, 767 F.3d 1383 (Fed. Cir. 2014). The AIA, however, provides that “The United States Court of Appeals for the Federal Circuit shall review the district court’s decision to ensure consistent application of established precedent, and such review may be de novo.” AIA § 18(b)(2). Although de novo review is not compelled by this language, de novo review is the “only standard mentioned in the statute.” *VirtualAgility Inc. v. Salesforce.com, Inc.*, 759 F.3d 1307, 1310 (Fed. Cir. 2014). While the district court erred in imposing a stay under either standard, the circumstances present here justify a de novo standard of review.

II. THE DISTRICT COURT ERRED IN GRANTING A STAY

The district court erred when it imposed a sweeping stay of the consolidated cases for all sixteen patents-in-suit and all of the Appellees. The AIA governs stays pending CBM review, and identifies four requisite factors:

- (A) whether a stay, or the denial thereof, will simplify the issues in question and streamline the trial;
- (B) whether discovery is complete and whether a trial date has been set;
- (C) whether a stay, or the denial thereof, would unduly prejudice the nonmoving party or present a clear tactical advantage for the moving party; and
- (D) whether a stay, or the denial thereof, will reduce the burden of litigation on the parties and on the court.

AIA § 18(b)(1). The stay applicant, TD, has the burden to show a stay is warranted. *Nken v. Holder*, 556 U.S. 418, 433-34 (2009).

The district court incorrectly found that the first, second and fourth factors weighed in favor of a stay,¹⁶ despite the fact that the CBM Review only impacts a small number of asserted patents, and despite the fact that six groups of Appellees have not agreed to be estopped by the outcome of the CBM Review. *See generally* A4-11. When these facts are properly considered, the factors enumerated in Section 18(b)(1) of the AIA weigh heavily against a stay.

¹⁶ The court found the third factor neutral, even though it also clearly strongly weighs against a stay. *See* A8-10.

A. A Stay Will Not Simplify Issues Or Streamline Trial Because Only A Small Subset Of The Asserted Patents Are Subject To CBM Review And Most Appellees Have Not Agreed To Be Estopped

The district court erred when it decided that the first factor, i.e., simplification of issues and streamlining of trial, weighed in favor of a stay. *See* A4-7. This factor weighs in favor of a stay when the CBM Review could dispose of the entire litigation. *VirtualAgility Inc.*, 759 F.3d at 1314 (finding it “significant that the PTAB [Patent Trial and Appeal Board] granted CBM Review on *all* asserted claims of the *sole* asserted patent”). However, a stay should *not* be imposed when a PTAB proceeding will not have a significant impact on the issues in the case. *Davol, Inc. v. Atrium Medical Corp.*, No. 12-958-GMS, 2013 WL 3013343, (D. Del. June 17, 2013) (denying stay where IPR was petitioned for only two of three patents and issues such as infringement and damages would not be addressed by IPR).

Here, the CBM Review will not dispose of the entire litigation, or even a significant portion of the litigation. The CBM Review involves just four out of the sixteen asserted patents in the consolidated cases.¹⁷ With respect to two of the patents – the ‘132 and ‘411 patents – only § 101 grounds are at issue, and these grounds have previously been rejected in a related case (*Trading Techs. Int’l, Inc.*

¹⁷ TT only asserted fifteen patents against TD. A10347-93.

v. CQG, et al., (N.D. Ill. 05 C 4811)) with respect to the ‘132 patent and the ‘304 patent.¹⁸ Thus, there are only two patents out of sixteen that are subject to review by the USPTO on grounds (§§ 101, 103) that have not already been decided by a court.

The district court erroneously concluded that “the PTO expressly determined that all of the claims in the ‘056 Patent, ‘055 Patent, ‘132 Patent, and the ‘411 Patent are more likely than not unpatentable.” A5. However, the USPTO made no such express determination. The district court likely misread the standard for instituting CBM Review, erroneously concluding that because the USPTO instituted CBM Review at all necessarily means that the claims are more likely than not unpatentable. The plain language of the statute reveals that this is squarely not the case. Specifically, in order to institute a CBM Review proceeding, the USPTO must determine that “the information presented in the petition filed under section 321, *if such information is not rebutted*, would demonstrate that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable.” 35 U.S.C. § 324(a) (emphasis added). As such, institution of CBM Review does not constitute anything close to “an express

¹⁸ The ‘411 patent is a direct continuation of the ‘132 patent, and also claims a novel graphical user interface tool that can be used to trade. Thus the district court’s logic upholding the graphical user interface claims of the ‘132 patent applies equally to the ‘411 patent.

determination” that the claims are more likely than not unpatentable. It merely constitutes a determination that the arguments presented *would* demonstrate more-likely-than-not-unpatentability *if such arguments were not rebutted*. In other words, the USPTO is required to take all allegations of the petitioner as true in deciding whether to institute CBM Review. Further, each decision to institute a CBM Review makes clear that by merely instituting proceedings the USPTO has not made a final determination. A25973, A26001, A26026, A26050 (“The Board has not made a final determination on the patentability of any challenged claim”).

Moreover, the district court failed to consider that discovery will not be simplified even if the CBM Reviews were successful. For example, all sixteen patents in the consolidated cases are asserted against the same accused products, so even if four patents were removed from the case, the discovery relating to the accused products and their functionality will be the same. Likewise, the same discovery on damages for the accused products will take place regardless of the number of patents. Moreover, as the asserted patents all pertain to aspects of electronic trading graphical user interfaces, the universe of prior art will not be impacted even if a few of the patents are removed from the case. Even TD admits that “the same discovery and prior art will be relevant to all asserted patents.” A23570.

Thus, no matter the outcome of these CMB Reviews at the PTO, the district

court will have to resolve the vast majority of claims and defenses, and discovery will not be meaningfully simplified because twelve patents still remain – patents that will *not* be impacted by the CBM Review whatsoever. As such, a stay under these facts is not warranted. *See Biomet Biologics, LLC v. Bio Rich Medical, Inc.*, No. SACV 10-1582 DOC (PJWx), 2011 WL 4448972, *3 (N.D. Cal. Mar. 8, 2012) (denying stay where not all patents and issues were addressed by reexamination).

There is another important reason why staying the case will not simplify the issues or streamline trial. Six of the seven groups of Appellees have not agreed to be bound by the statutory estoppel that applies to the petitioner, TD. *See, e.g.*, A24657, A26716 (“the SunGard Defendants do not consent to be bound in any way by rulings on the CBM petitions filed by TD Ameritrade”); AIA § 18(a)(1)(D) (providing that when a CBM Review results in a “final written decision,” the petitioner or its real party in interest “may not assert, either in a civil action [or in an ITC proceeding] that the claim is invalid on any ground that the petitioner raised during” the CBM Review). In other words, if TD does not prevail on the CBM Review, then the other Appellees want the right to re-litigate the very same issues – either at the district court or at the USPTO – again. This is contrary to the purpose of CBM Review, and another reason why this Court should reverse the district court. *See Tesco Corp. v. Weatherford Int’l, Inc.*, 599 F. Supp. 2d 848,

851-52 (S.D. Tex. 2009) (“[w]here, as here, however, there are several Appellees who are not party to the reexamination proceeding, they are not bound by estoppel effects of the reexamination and estoppel does not affect prejudice...or the simplification of issues...in the same way”); *Cf. Credit Acceptance Corp. v. Westlake Servs., LLC*, No. CV 13-01523 SJO (MRNx), 2013 WL 7144391, *3 (C.D. Cal. Dec. 30, 2013) (finding that one Appellee’s filing of CBM petition would simplify issues in case even if claims were not cancelled because *all Appellees* agreed that if a stay was issued, they would likewise be estopped).

The district court erred by refusing to consider the lack of estoppel for all Appellees, going so far as to find this fact “*irrelevant to the stay analysis.*” A7 (emphasis added). While estoppel is not an explicit factor in the stay analysis, it heavily influences whether there will be any real simplification of issues in such a context. *See e.g., Evolutionary Intelligence, LLC v. Millennial Media, Inc.*, 2014 WL 2738501, *3, 6 (N.D.Cal., 2014) (finding that the benefit of a stay pending *inter partes* review is based on the proceeding’s estoppel effect and thus conditionally granting defendant’s motion to stay contingent upon defendant agreeing to be bound by same estoppel that limits IPR petitioners); *Audatex N. Am. Inc. v. Mitchell Int’l Inc.*, 46 F. Supp. 3d 1019, 1023 (S.D. Cal. 2014); *Xilidev, Inc. v. Boku, Inc.*, No. 13-cv-2793, 2014 WL 3353256, *1 n. 1 (S.D. Cal. July 1, 2014). Without the estoppel applying to all Appellees, no meaningful simplification of

issues will occur because the same issues may be raised again and again. Thus, this factor weighs heavily against a stay.

B. A Stay Should Not Be Imposed Given That This Case Is Already Five Years Old

The district court found that the next factor—whether discovery is complete and whether a trial date has been set—favored a stay. A7-8. The purpose of this factor is to encourage stays for cases in their early stages where CBM Review could be a more efficient route than litigation. *See* A24741 (stmt. of Sen. Schumer remarking that the CBM Review program was “designed to provide a cheaper, *faster* alternative to district court litigation”). Although discovery has not been completed and no trial date has been set, this case cannot fairly be characterized as being in its “early stages.” In fact, this is the second stay issued by the district court in this five year-old litigation. A6417-21 (district court entering stay while it considered certain “initial matters,” including the summary judgment motions related to, *inter alia*, the ‘411 and ‘056 patents).

Indeed, the consolidated cases have been languishing in the court system with no end in sight. Much of this delay is due to Appellee’s piecemeal approach to this litigation, and the district court’s premature review of summary judgment issues on just a few patents while staying all discovery. This piecemeal approach to litigation has caused delay without any movement on discovery. The CBM Review and the associated stay is just the latest tactic by Appellees to indefinitely delay resolution of

this litigation. And while the purpose of CBM Review is to provide faster and cheaper alternatives to litigation, here, Appellees are using the CBM Reviews for the opposite purpose – to slow down resolution and increase the cost of the litigation for TT. Even though no trial date has been set, the particular circumstances here still weigh against a stay.

C. A Stay Awards Appellees A Clear Tactical Advantage and Unduly Prejudices TT

As for the third factor – undue prejudice to the nonmoving party *or* awarding a clear tactical advantage to the moving party – the district court erred by deciding that this factor was neutral, despite acknowledging that TT and TD are competitors. In reality, this factor weighs heavily in favor of TT.

1. Imposing a Stay Provides Several Tactical Advantages to Appellees

Here, imposing a stay awards Appellees clear tactical advantages – multiple bites at the invalidity apple, serial attacks of the patents-in-suit, and continued delay of the resolution of this case on the merits.

First, imposing a stay would promote Appellees' ability to litigate the same issue multiple times. As noted above, none of the non-petitioning Appellees have agreed to be bound by estoppel. This enables them to re-raise the very same issues resolved by CBM Review, thereby unnecessarily and improperly multiplying the proceedings. *Pi-Net Int'l, Inc. v. Focus Business Bank*, No. C-12-4958-PSG, 2013

WL 4475940, *6-7 (N.D. Cal. Aug. 16, 2013) (finding non-petitioner Appellees would gain a clear tactical advantage “to take multiple bites at the invalidity apple while avoiding the estoppel provisions,” and denying stay unless all Appellees agreed to be bound by same estoppel effect as petitioner). For instance, if the USPTO determines that the patents are not invalid over Appellees’ §§ 101 and 103 arguments, the non-petitioning Appellees may raise the very same issues at the district court level that are dismissed in the CBM Review. TD has already used this tactic before, raising the very same written description argument for the ‘056 patent in its CBM petition after the lower court rejected this argument and granted summary judgment in favor of TT.¹⁹ A21486, A21510-12, A23849-54. This demonstrates that Appellees are not legitimately focused on speedy resolution on the merits.

Second, a stay would promote serial attacks on the patents-in-suit. For example, TD held back from its CBM petitions some of the key alleged prior art references Appellees have relied on to date, such as GL TradePad and ePit alleged prior art, to avoid being estopped from raising them in future proceedings.

A13408-575. As another example, while TD told the district court that the ‘411 written description issue was dispositive, TD’s CBM Petition does not even

¹⁹ The USPTO ultimately rejected this argument as a ground of institution of CBM Review. A25965-67 (“Petitioner has not shown that it is more likely than not that

mention this argument. A23907-94. All of this shows that TD is intent on serially litigating this case in different forums rather than reducing the burden on this Court and TT. This directly contradicts the purpose of the AIA, which was intended to “[r]educe the ability to use post-grant procedures for abusive serial challenges to patents,” and prohibit “attempts to use the transitional program against patent owners in a harassing way.” A24737 (stmt. of Sen. Grassley); A25089 (stmt. of Sen. Grassley).

Finally, using the stay provision of the CBM Review is simply the latest tactic TD and the other Appellees have used to delay this case indefinitely. The point of CBM Review is to expedite and streamline the review of patents in a more cost effective manner than litigation. A24741 (stmt. of Sen. Schumer remarking that the CBM review program was “designed to provide a cheaper, *faster* alternative to district court litigation”). Here, Appellees are using the CBM Review process and corresponding stay provision as a tactic to improperly multiply proceedings and delay resolution of the litigation. Although the CBM Review system has been available to Appellees since September of 2012, TD did not file a CBM petition for nearly two years. Indeed, TD only filed CBM petitions after its two attempts to invalidate certain of TT’s patents failed and after the district court finally ordered the parties to provide a proposed discovery schedule.

the claims lack written description support.”).

And while the case was stayed for nearly two years pending an appeal with respect to a few patents, nothing prevented TD from filing CBMs for the patents that were not at issue in the appeal (e.g., ‘132, ‘304, and ‘056 patents).

2. *TT is unduly prejudiced by another stay of this case*

Staying this case results in undue prejudice to TT because it is undisputed that TT and TD/Appellees are direct competitors. While the district court acknowledged that TT and TD are competitors, it erred in finding that TT would suffer no prejudice from a stay. A8-10. Indeed, TT would be significantly harmed from a further stay of this five year-old case because it practices the patents-in-suit by making, using, and selling its MD_Trader product in direct competition with Appellees. *See VirtualAgility Inc.*, 759 F.3d at 1318 (agreeing with district court that competition between parties weighs in favor of finding undue prejudice); *see also* A25091-96. As Farley Owens, one of TT’s Executive Vice Presidents attests, TT’s business revolves around its ability to practice the patents at issue without interference from Appellees. *Id.* TT’s inability to timely resolve this case against its competitors continues to result in a loss of market share and an erosion of goodwill.

The district court also erred by finding that TT would **not** suffer from an evidentiary loss by a further stay. A9. As the case is over 5 years old and infringement goes back over 10 years, any further delay both increases the cost of

retrieving such information and the likelihood of that information being destroyed, lost, or forgotten. TT has already suffered loss of information in other cases in which there was a stay for several years pending Federal Circuit review. For example, TT has encountered instances where trading records were not maintained, where parties failed to track usage of accused products, and where traders' memories faded about the products they used and the settings they used with particular products. A24725.²⁰ This occurred despite litigation holds being enacted in these cases.

Further, the district court placed undue emphasis on the fact that TT did not move for a preliminary injunction. A8-10. Yet TT's decision not to move for a preliminary injunction in this case has no bearing on the prejudice TT sustains by not being able to exclude its competitors from infringing. *See VirtualAgility Inc.*, 759 F.3d at 1319. Likewise, TT's decision to forgo a preliminary injunction motion is not an admission that TT is not being prejudiced by the infringement. *See id.* at 1318-19 (acknowledging that "there could be a variety of reasons that a patentee does not move for a preliminary injunction"); *Audatex N. Am. Inc.*, 46 F. Supp. 3d at 1026 (explaining that "there are numerous possibilities" for why plaintiff did not pursue injunctive relief and court "will not place great weight

²⁰ The district court declined to review this evidence, but there is no dispute that this evidentiary loss has occurred.

upon a decision not to reveal litigation strategy”); *Verinata Health, Inc. v. Ariosa Diagnostics, Inc.*, No. C 12-05501 SI, 2014 WL 121640, at *3 (N.D. Cal. Jan. 13, 2014) (“[A] party may decide to forego seeking a preliminary injunction for a variety of reasons having nothing to do with its view of the merits.”) (internal quotation marks omitted); *Biomet Biologics, LLC*, WL 4448972, at *2 (“[T]his Court will not hold against Plaintiffs their decision not to pursue a preliminary injunction.”); *Avago Techs. Fiber IP (Singapore) Pte. Ltd. v. IPtronics Inc.*, No. 10-CV-02863-EJD, 2011 WL 3267768, at *6 (N.D. Cal. July 28, 2011) (holding undue prejudice factor weighed against a stay even though no preliminary injunction sought because of “difficulty of showing a likelihood of success on the merits while its patents are in reexamination”). In the consolidated cases, TT is seeking a *permanent* injunction—just as it successfully did in *eSpeed* on two of the same patents-in-suit, the ‘132 and ‘304 patents.

TT also suffers undue prejudice from a further stay of this case because Appellees are given an advantage over entities that have (1) previously taken licenses and paid TT, (2) designed around TT’s patents, or (3) litigated against TT to trial. Appellees are also allowed to continue infringing while these entities and TT must compete against Appellees who neither stop infringing nor pay TT a license fee. Thus, the public interest weighs against a stay.

**D. A Stay Will Not Reduce The Burden Of
Litigation On The Parties And The Court**

Finally, the district court incorrectly found that the fourth factor – burden of litigation – favored a stay of the consolidated cases. A10-11. The district court erred here for the same reasons discussed above with respect to the first factor. *Id.* Because the twelve of the Appellees have not joined in the CBM petitions, and have refused to agree to be estopped from raising the same issues as those raised in the CBM petitions, they can simply try to re-litigate the same issues TD raised before the USPTO in the CBM Review. Further, even if all Appellees were estopped to the same extent as TD, this would not prevent them from raising additional prior art that they have withheld to this point, whether at the district court level or in further CBM petitions. As noted, TD did not include its key prior art arguments in its CBM petitions, and thus, may still raise these grounds in the litigation.

Thus, staying the case pending review of just a handful of prior art references for two patents-in-suit (of sixteen) when Appellees have not agreed to be estopped will not reduce the burden of litigation in any meaningful way. In fact, a stay will increase the burden of the litigation to TT, Appellees, and the district court. In particular, Appellees are compounding the litigation burden and costs by subjecting the patents to cumulative reviews of prior challenges, serially challenging the patents-in-suit, and imposing further delay. And the PTAB trials on four different patents are quite costly as they involve expert depositions, hearings, and other

discovery analogous to district court litigation.

Ultimately, because just a small subset of the patents are involved in the CBM Review, and because the same products are accused of infringing all of the patents-in-suit, the burden of discovery and further litigation on the remaining twelve patents will not be meaningfully reduced in this litigation by a stay.

CONCLUSION AND STATEMENT OF RELIEF SOUGHT

The district court erred in staying this case pending CBM Review, where twelve of the Appellees have not agree to be bound by the CBM petitioner and only four of the sixteen asserted patents-in-suit are undergoing CBM Review. The factors enumerated in Section 18(b)(1) of the AIA weigh heavily against a stay. Therefore, this Court should reverse the district court's ruling staying this case pending CBM Review, and remand the case for further proceedings including setting a discovery schedule and proceeding with the case.

Respectfully submitted,

Date: April 27, 2015

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FORM 30. Certificate of Service

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FOR THE FEDERAL CIRCUIT

CERTIFICATE OF SERVICE

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CERTIFICATE OF COMPLIANCE

I hereby certify that the foregoing Opening Brief of Plaintiff-Appellant Trading Technologies International, Inc. complies with the type-volume limitations of FED. R. APP. P. 32(a)(7)(B)(i) because it contains 6,853 words as measured by the word-processing software used to prepare this brief, excluding portions exempted from this requirement by FED. R. APP. P. 32(a)(7)(B)(iii) and FED. CIR. R. 32(b).

ADDENDUM

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

TRADING TECHNOLOGIES)	
INTERNATIONAL, INC.,)	No. 10 C 715 (Consolidated with:
)	10 C 716, 10 C 718, 10 C 720,
)	10 C 721, 10 C 726, 10 C 882,
Plaintiff,)	10 C 883, 10 C 884, 10 C 885,
v.)	10 C 929, 10 C 931)
)	
BCG PARTNERS, INC,)	Judge Virginia M. Kendall
)	
Defendant.)	
)	
)	

MEMORANDUM OPINION AND ORDER

In early 2010, Plaintiff Trading Technologies International, Inc. (“TT”) filed a number of cases in this District alleging infringement of various patents concerning electronic trading software used on electronic commodity exchanges. The Court consolidated these cases in 2011. *See* Dkt. No. 73. After a number of amended pleadings, early summary judgment practice, and an appeal to the Federal Circuit, Defendants TD Ameritrade, IBG LLC, and TradeStation¹ (collectively, the “Moving Defendants”) filed motions seeking a stay of this case pursuant to Section 18(b) of the America Invents Act (“AIA”) pending the United States Patent and Trademark Office’s (“PTO”) review of a number of the asserted patents. *See* Dkt. Nos. 545, 549, and 558. For the following reasons, the Court grants the motions to stay. The consolidated cases are stayed in their entirety.

BACKGROUND

The instant motions stem from five petitions filed by TD Ameritrade on May 19 and 20, 2014 with the PTO seeking review under the transitional program for covered business method

¹ Defendants Sungard and CQG filed position statements stating that they did not oppose the motion to stay. *See* Dkt. Nos. 548 and 553. No defendant has objected to a stay being entered.

patents (“CBM review”) of U.S. Patent Nos. 7,533,056 (“the ‘056 Patent”); 7,685,055 (“the ‘055 Patent”); 6,772,132 (“the ‘132 patent”); 7,676,411 (“the ‘411 Patent”); and 6,766,304 (“the ‘304 Patent”) (collectively, the “CBM Patents”). TD Ameritrade challenged the patentability of all of the claims within the CBM Patents, arguing, among other things, that they are patent ineligible under 35 U.S.C. § 101. On December 2, 2014, the PTO determined that the petitions for (1) the ‘056 Patent, (2) the ‘055 Patent, (3) the ‘132 Patent, and (4) the ‘411 Patent demonstrate that it is more likely than not that all of the challenged claims are patent ineligible under 35 U.S.C. § 101 and therefore instituted CBM review of the 118 challenged claims.² The PTO declined to institute CBM review of the claims within the ‘304 Patent. CQG filed a petition with the PTO for CBM review of the ‘132 and ‘204 Patents on January 9, 2015.

LEGAL STANDARD

Section 18 of the AIA provides for the establishment of transitional post-grant review proceedings to reexamine the validity of covered business method patents. Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 18, 125 Stat. 284 (Sept. 16, 2011). The AIA also establishes protocol with respect to related patent infringement actions and authorizes the district courts to stay such parallel litigation under certain circumstances. Specifically, § 18(b)(1) states:

If a party seeks a stay of a civil action alleging infringement of a patent under section 281 of title 35, United States Code, relating to a transitional proceeding for that patent, the court shall decide whether to enter a stay based on--

- (A) whether a stay, or the denial thereof, will simplify the issues in question and streamline the trial;
- (B) whether discovery is complete and whether a trial date has been set;
- (C) whether a stay, or the denial thereof, would unduly prejudice the nonmoving party or present a clear tactical advantage for the moving party; and

² The PTO additionally concluded that it is more likely than not that all of the claims of the ‘056 Patent and all but one of the claims of the ‘055 Patent are unpatentable under 35 U.S.C. § 103.

(D) whether a stay, or the denial thereof, will reduce the burden of litigation on the parties and on the court.

Id. The statutory test thus closely resembles the stay analysis courts have applied in assessing a motion to stay pending *inter partes* or *ex parte* reexamination by the PTO. *See, e.g., Genzyme Corp. v. Cobrek Pharm., Inc.*, No. 10 CV 00112, 2011 WL 686807, at *1 (N.D. Ill. Feb. 17, 2011) (applying three-factor stay test that considers “whether a stay will (1) unduly prejudice or tactically disadvantage the non-moving party, (2) simplify the issues in questions and streamline the trial, and (3) reduce the burden of litigation on the parties and on the court”); *JAB Distribs., LLC v. London Luxury, LLC*, No. 09 C 5831, 2010 WL 1882010, at *1 (N.D. Ill. May 11, 2010).

The AIA’s inclusion of the fourth factor was included, in part, to favor the granting of stays. *See, e.g., Segin Sys., Inc. v. Stewart Title Guar. Co.*, 30 F. Supp. 3d 476, 480 (E.D. Va. 2014) (fourth factor “designed to place a thumb on the scales in favor of a stay”); *Market-Alerts Pty. Ltd. v. Bloomberg Fin. L.P.*, 922 F. Supp. 2d 486, 489-90 (D. Del. 2013) (fourth factor included “to ease the movant’s task of demonstrating the need for a stay”). Congress signed the AIA into law on September 16, 2011, and CBM review came into effect in September 2012.

DISCUSSION

The Moving Defendants seek a stay of the litigation brought against them, arguing that the PTO’s decision on the CBM patents will thoroughly streamline the future litigation and affect the other asserted patents due to similar claim terms, inventors, and prior art shared amongst the patents. TT opposes the motion, primarily contending that because the PTO instituted review on only four of the fifteen patents in issue, any simplification is minimal and a stay is therefore unwarranted. But because the PTO instituted CBM review on 118 of the approximately 400 claims at issue in this litigation and PTO reasoning and determinations will necessarily affect how the Court views the remaining claims, the Court concludes that a stay of the consolidated

cases is most efficient for the parties, best conserves judicial resources, and avoids piecemeal litigation. The Court's decision is bolstered by the fact that at least one of the CBM Patents is asserted against each remaining defendant to this litigation. Here, the factors of the AIA test weigh in favor of a stay.

A. Simplification of the Issues

Section 18(b)(1)(A) instructs the Court to consider "whether a stay, or the denial thereof, will simplify the issues in question and streamline the trial." Pub. L. No. 112-29, § 18(b)(1)(A). As courts in this district have previously noted, staying a patent infringement case pending administrative review of the asserted patents' validity can simplify litigation in several ways:

1. All prior art presented to the Court will have been first considered by an expert PTO examiner;
2. The reexamination may alleviate discovery problems relating to the prior art;
3. The suit will likely be dismissed if the reexamination results in effective invalidity of the patent;
4. The outcome of the reexamination may encourage settlement;
5. The record of the reexamination would likely be entered at trial and thus reduce the complexity and length of the litigation;
6. The reexamination will facilitate limitation of issues, defenses, and evidence in pre-trial conferences;
7. Litigation costs to the parties and the Court will likely be reduced.

Genzyme, 2011 WL 686807, at 3-4 (quoting *Emhart Indus., Inc. v. Sankyo Seiki Mfg. Co., Ltd.*, No. 85 C 7565, 1987 WL 6314, at 2 (N.D. Ill. Feb. 2, 1987); *see also, e.g., Tap Pharm. Prods., Inc. v. Atrix Labs., Inc.*, No. 03 C 7822, 2004 WL 422697, at *1 (N.D. Ill. Mar. 3, 2004) (stay warranted because "[t]here is a significant chance that the PTO will either invalidate this patent or drastically decrease its scope [due to reexamination] . . . [creating] a very real possibility that the parties will waste their resources litigating over issues that will ultimately be rendered moot by the PTO's findings").

These benefits exist even if only some of the litigated claims are undergoing CBM review. *See Versata Software, Inc. v. Callidus Software, Inc.*, 771 F.3d 1368, 1371-72 (Fed. Cir. 2014) (although the simplification factor “weighs more strongly in favor of stay when *all* of the litigated claims” are being reviewed, “stays can be warranted even when a CBM proceeding does not address all asserted patents, claims, or invalidity defenses”), *vacated*, No. 2014-1568³; *see also Versata Software, Inc. v. Dorado Software, Inc.*, No. 2:13-cv-00920-MCE-DAD, 2014 WL 1330652, at *3 n.2 (E.D. Cal. Mar. 27, 2014) (staying case where CBM review granted for only one of three asserted patents and for less than all claims); *Destination Maternity Corp. v. Target Corp.*, 12 F. Supp. 3d 762, 769 (E.D. Pa. 2014) (“courts have found significant potential for issue simplification even in cases where some but not all of the asserted claims are subject to PTO review”); *Genzyme*, 2011 WL 686807, at *3 (stay warranted even though “certain issues may remain in dispute even upon conclusion of the reexamination proceedings”). In this case, the PTO expressly determined that all of the claims in the ‘056 Patent, the ‘055 Patent, the ‘132 Patent, and the ‘411 Patent are more likely than not unpatentable. *See* Dkt. No. 572 Exs. A-D. The PTO further determined that the claims within the ‘056 and ‘055 Patents are more likely than not unpatentable on two separate, alternative grounds. *See VirtualAgility Inc. v. Salesforce.com, Inc.*, 759 F.3d 1307, 1314 (Fed. Cir. 2014) (evidence in the record weighed “heavily in favor of a stay” in part because the PTO determined that all of the challenged claims were more likely than not unpatentable on two grounds). Because the CBM review could dispose entirely of four of the asserted patents and 118 of the asserted claims, this factor weighs in favor of a stay.

³ The Federal Circuit vacated its opinion on February 27, 2015, after recognizing that the original opinion was issued one day after the parties filed a joint request to dismiss the appeal. The vacate order did not disavow the reasoning of the original opinion. While the Court is aware that the vacated opinion is not binding, the Court finds its reasoning persuasive nonetheless.

Additionally, CBM review of the four CBM patents will undoubtedly shape future claim construction and litigation with respect to the other asserted patents. TT argues at length that the Court should deny the stay because eleven patents, regardless of the CBM review, will remain at issue. TT's position fails to recognize that even though some issues and claims will remain after CBM review, the cancellation of any claim "could significantly alter this action by clarifying and narrowing the claims and defenses available" to the parties here. *Dorado*, 2014 WL 1330652, at *2. The fact that the PTO is reviewing only a subset of the asserted patents, while lessening the potential simplification of the issues, does not eliminate the benefit of a stay in order to avoid duplicious litigation on potentially moot claims and issues. *See VirtualAgility*, 759 F.3d at 1314 (disposing of the entire litigation is "the ultimate simplification of issues"). Moreover, TD Ameritrade points out, and TT does not dispute, that a majority of the non-CBM Patents share several common claim terms with the four CBM Patents. *See* Dkt. No. 561 at 8. Accordingly, the PTO's decisions will likely provide guidance on a number of the issues concerning the non-CBM Patents. *See, e.g., Old Reliable Wholesale, Inc. v. Cornell Corp.*, 635 F.3d 539, 548 (Fed. Cir. 2011) ("PTO has acknowledged expertise in evaluating prior art and assessing patent validity"); *SenoRx, Inc. v. Hologic, Inc.*, No. 12-173-LPS-CJB, 2013 WL 144255, at *4 (D. Del. Jan. 11, 2013) (courts benefit from the PTO's analysis of prior art that is later presented in litigation regardless of the outcome of the review).

Finally, the Court does not find that the non-petitioning defendants' refusal to consent to be estopped from raising arguments offered during CBM review eliminates the simplification of the issues. A reading of the AIA leads to the conclusion that Congress explicitly chose to estop *petitioners* of CBM review while allowing any *party* to a case to seek a stay pending CBM review. *See* Pub. L. No. 112-29, §§ 6(e)(1), 18(b)(1). Moreover, a review of the Senate's hearing

on the AIA confirms that whether or not a party to a patent proceeding agrees to be estopped from raising a co-defendant's arguments is irrelevant to the stay analysis. *See* 157 Cong. Rec. S1360, 2011 WL 797877 (daily ed. Mar. 8, 2011) (statement of Sen. Schumer) ("By codifying the exclusive set of factors that courts are to consider when granting stays, the [AIA] precludes courts from inventing new factors such as extra-statutory estoppel tests.").

Because the PTO instituted review on all of the claims in four asserted patents, "there will . . . be [at least] some amount of simplification for the court and the parties." *Cf. Moneycat Ltd. v. Paypal Inc.*, No. 14 CV 02490 JST, 2014 WL 5689844, at *3 (N.D. Cal. Nov. 4, 2014). A stay here could eliminate the need to litigate 118 of TT's claims and prevent the parties from litigating any defenses that may ultimately be mooted or significantly altered by a PTO decision. Therefore, the first factor weighs in favor of a stay.

B. Stage of Litigation

This factor weighs heavily in favor of staying the consolidated cases. "Staying a case at an early juncture 'can be said to advance judicial efficiency and maximize the likelihood that neither the Court nor the parties expend their assets addressing invalid claims.' " *Trading Techs., Inc. v. CQG, Inc.*, No. 05 CV 4811, 2015 WL 161639, at *2 (N.D. Ill. Jan. 13, 2015) (quoting *Market-Alerts*, 922 F. Supp. 2d at 494). Although the consolidated cases were filed over four years ago, the parties have not engaged in any discovery beyond, at the most, initial disclosures between TT and some of the defendants.⁴ The Court ruled on a number of summary judgment motions early in the proceedings, but these motions were brought before discovery began and the case stagnated while the Federal Circuit considered an appeal. Since the Federal Circuit's mandate issued on December 4, 2013, the parties have exchanged no discovery and no schedule

⁴ TT asserts that it has exchanged initial disclosures with four of the defendants to date. TD Ameritrade disputes this characterization, arguing that there has been no discovery whatsoever in any of the consolidated cases since TT expanded its infringement claims. Either way, the discovery in the consolidated cases is in its infancy.

has been set. Because the consolidated cases, despite their age, have not progressed with discovery nor begun claim construction, this factor strongly favors staying the cases. *Compare VirtualAgility*, 759 F.3d at 1317 (stage of litigation factor favored stay where “discovery had not yet begun and no trial date had been set”); *Dorado*, 2014 WL 1330652, at *3 (factor supported stay because court had not entered a scheduling order and the parties had only exchanged initial disclosures); and *Norred v. Medtronic, Inc.*, No. 13-2061, 2014 WL 554685, at *2 (D. Kan. Feb. 12, 2014) (granting stay where case was “still in its early stages”); *with Trading Techs.*, 2015 WL 161639, at *2 (factor weighed strongly against a stay because the case was 73 days from trial, pretrial dates were set, claim construction was complete, and only rebuttal experts were left outstanding). The stage of the litigation therefore strongly supports a stay.

C. Undue Prejudice or Tactical Advantage

When assessing the third factor in determining whether to grant a stay pending CBM review, courts consider a variety of factors to determine the prejudice to the non-movant, “including the timing of the stay request, the status of review proceedings, and the relationship between the parties.” *Trading Techs.*, 2015 WL 161639, at *3. TD Ameritrade asserts that a stay would not unduly prejudice TT or provide TD Ameritrade with a tactical advantage because it filed its CBM petitions soon after the Federal Circuit’s mandate came down and there is no evidence in the record of dilatory motive. TT argues primarily that it would be unduly prejudiced by a stay because TD Ameritrade is a direct competitor and TD Ameritrade improperly waited to submit its CBM petitions to the PTO. Because the Court notes that the parties are competitors, but TT never sought preliminary injunctive relief and there is no evidence that TD Ameritrade submitted its petitions when it did only to delay, this factor weighs neither for nor against a stay.

Here, the PTO's review of the CBM Patents is required to be completed by December 2015, so the delay is not extreme. Moreover, the potential for delay, by itself, does not establish undue prejudice. *See VirtualAgility*, 759 F.3d at 1319; *Trading Techs.*, 2015 WL 161639, at *3; *Genzyme*, 2011 WL 686807, at *3 ("Any delay that inheres in the reexamination process does not by itself constitute undue prejudice."). While evidence of a dilatory motive may counsel against a stay, the record does not establish that TD Ameritrade acted maliciously by filing its CBM petitions. TT contends that TD Ameritrade could have pursued CBM review since September 2012, and its failure to do so until May 2014 constitutes gamesmanship. But CBM review became available only after TT appealed this Court's Order invalidating four of the asserted patents, including the '056 and '411 Patents. The Federal Circuit resolved the appeal and issued its mandate on December 4, 2013, and TD Ameritrade filed its CBM petitions in May 2014. Considering the number of claims at issue, such a length of time was not unreasonable. *See VirtualAgility*, 759 F.3d at 1319 (noting that defendant filed for CBM review less than four months after infringement action instituted); *Zillow, Inc. v. Trulia, Inc.*, No. C12-1549JLR, 2013 WL 5530573, at *7 (W.D. Wash. Oct. 7, 2013) (not unreasonable for party to defer seeking CBM review until motion affecting challenged patents was resolved). TT's argument that it will suffer prejudice in the event of a stay because of evidentiary loss is similarly unpersuasive. *See VirtualAgility*, 759 F.3d at 1319 ("It is undoubtedly true . . . that with age and the passage of time, memories may fade and witnesses may become unavailable. Without more, however, these assertions are not sufficient to justify a conclusion of undue prejudice.").

Moreover, TT's cries of undue prejudice are belied by its approach to this litigation. TT never sought a preliminary injunction and waited more than a year after TD Ameritrade released its accused technology to institute its infringement action. TT's earlier conduct therefore

contradicts its contentions that a stay now would cause undue prejudice. *See id.* at 1319-20 (while not dispositive, “patentee’s delays in pursuing suit and seeking preliminary injunctive relief belie its claims that it will be unduly prejudiced by a stay”); *see also, e.g., Zillow*, 2013 WL 5530573, at *6 (“attempts by a patentee to argue undue prejudice are undermined if the patentee has elected not to pursue preliminary injunctive relief”); *Ever Win Intern. Corp. v. Radioshack Corp.*, 902 F. Supp. 2d 503, 511 (D. Del. 2012) (“Plaintiff never sought a preliminary injunction, which suggests that any prejudice to Plaintiff that might result from delaying the ultimate resolution of this dispute is not as severe as it contends.”); *BodyMedia, Inc. v. Basis Science, Inc.*, No. 12-cv-133 (GMS), 2013 WL 2462105, at *1, n. 1 (D. Del. June 06, 2013); *Hill-Rom Servs., Inc. v. Stryker Corp.*, No. 1:11-cv-1120-JMS-DKL, 2012 WL 5878087, at *2 (S.D. Ind. Nov. 20, 2012) (“[A]ttempts by a patentee to argue undue prejudice are undermined if it has elected not to pursue a preliminary injunction.”); *JAB Distribs.*, 2010 WL 1882010, at *4 (“Plaintiff’s claim that it will suffer irreparable harm is undermined by the fact that its complaint . . . does not seek preliminary injunctive relief”). The Court nevertheless notes, however, that TT and TD Ameritrade are competitors and “competition between parties can weigh in favor of finding undue prejudice.” *VirtualAgility*, 759 F.3d at 1318. This factor therefore weighs neither for nor against a stay.


D. Burden of Litigation

The Court finds that this factor also favors a stay. If the PTO cancels some or all of the claims in the four CBM Patents, then those claims will no longer be at issue. *See Ignite USA, LLC v. Pac. Mkt. Int’l, LLC*, No. 14 C 856, 2014 WL 2505166, at *4 (N.D. Ill. May 29, 2014). The PTO may also narrow claims in response to prior art, which may not only affect the CBM Patents, but a majority of the other asserted patents that utilize similar claim terms.

Without a stay, “simultaneous proceedings present substantial risks that the parties and [C]ourt will expend resources unnecessarily.” *Id.* The PTO has made the preliminary conclusion that all of the claims in the ‘056, ‘055, ‘132, and ‘411 Patents are more likely than not unpatentable. Without a stay, if the PTO maintains this position, the parties will have engaged in unnecessary litigation of up to 118 asserted claims. Accordingly, the Court concludes that a likely reduced litigation burden also favors a stay of the consolidated cases.

CONCLUSION

For the reasons stated herein, the Court grants the Moving Defendants’ Motions to Stay and stays the consolidated cases in their entirety.



Virginia M. Kendall
United States District Court Judge
Northern District of Illinois

Date: 3/25/2015



US006766304B2

(12) **United States Patent**
Kemp, II et al.

(10) **Patent No.:** **US 6,766,304 B2**
(45) **Date of Patent:** **Jul. 20, 2004**

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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5,793,301 A 8/1998 Patterson, Jr. et al.

(75) Inventors: **Gary Allan Kemp, II**, Winnetka, IL (US); **Jens-Uwe Schluetter**, Evanston, IL (US); **Harris Brumfield**, Chicago, IL (US)

(List continued on next page.)

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(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 544 days.

(21) Appl. No.: **09/894,637**

(22) Filed: **Jun. 27, 2001**

(65) **Prior Publication Data**

US 2002/0059129 A1 May 16, 2002

Related U.S. Application Data

(62) Division of application No. 09/590,692, filed on Jun. 9, 2000.

(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

(51) **Int. Cl.** ⁷ **G06F 17/60**

(52) **U.S. Cl.** **705/37; 705/36; 705/35**

(58) **Field of Search** **705/35, 36, 37; 345/814**

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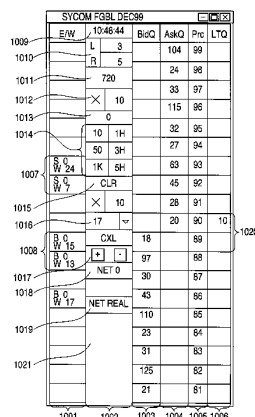
Primary Examiner—Richard Weisberger

(74) *Attorney, Agent, or Firm*—Foley & Lardner

(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The “Mercury” display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

40 Claims, 6 Drawing Sheets



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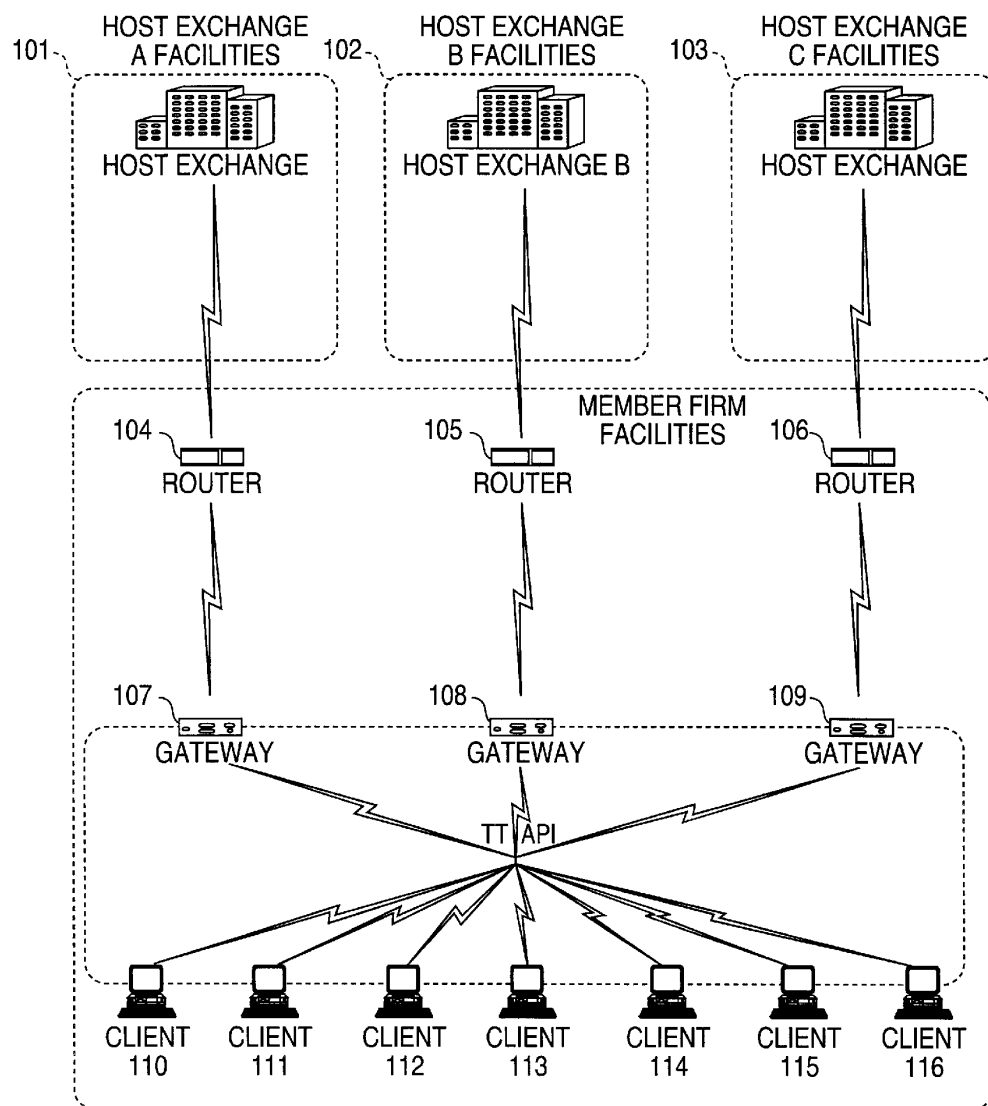
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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



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FIG. 2

	201	202	203	204	205				
	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

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FIG. 3

SYCOM FGBL DEC99										[-][][X]		
E/W		10:48:44		BidQ	AskQ	Prc	LTQ					
1009		L	3		104	99						
1010		R	5		24	98						
1011		720			33	97						
1012		X	10		115	96						
1013		0			32	95						
1014		10	1H		27	94						
		50	3H		63	93						
1007	S 0	W 24	1K	5H		45	92					
	S 0		CLR			28	91					
1015		X	10		20	90	10			1020		
1016		17	▽		18	89						
1008	B 0	W 15	CXL		97	88						
	B 0		+	-	30	87						
1017		W 13	NET 0		43	86						
1018	B 0	W 17	NET REAL		110	85						
1019					23	84						
1021				31	83							
				125	82							
				21	81							
1001		1002		1003	1004	1005	1006					

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FIG. 4

SYCOM FGBL DEC99								
E/W	10:48:44		BidQ	AskQ	Prc	LTQ		
	L	3		104	99			
	R	5		24	98			
	720			33	97			
	×	10		115	96			
	0			32	95			
	10	1H		27	94			
	50	3H		63	93	10		
S 10 W 14	1K	5H						
	CLR		43		92			
	×	10	125		91			
	17	▼	97		90			
B 0 W 15	CXL		18		89			
B 0 W 13	+	-	97		88			
	NET 0		30		87			
B 0 W 17	NET REAL		43		86			
			110		85			
			23		84			
			31		83			
			125		82			
			21		81			

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FIG. 5

SYCOM FGBL DEC99								
E/W	10:48:44		BidQ	AskQ	Prc	LTQ		
1206	L	3		104	99			
	R	5		24	98			
1205	720			33	97			
	×	10		115	96			
	0			32	95			
	10	1H		27	94			
	50	3H		63	93			
S 0 W 24	1K	5H		45	92			
S 0 W 7	CLR			28	91			
	×	10		20	90	10		
	17	▼		18	89			
B 0 W 15	CXL		97		88			
B 0 W 13	+	-	30		87			
	NET 0		43		86			
B 0 W 17	NET REAL		110		85			
			23		84			
			31		83			
			125		82			
			21		81			

1208

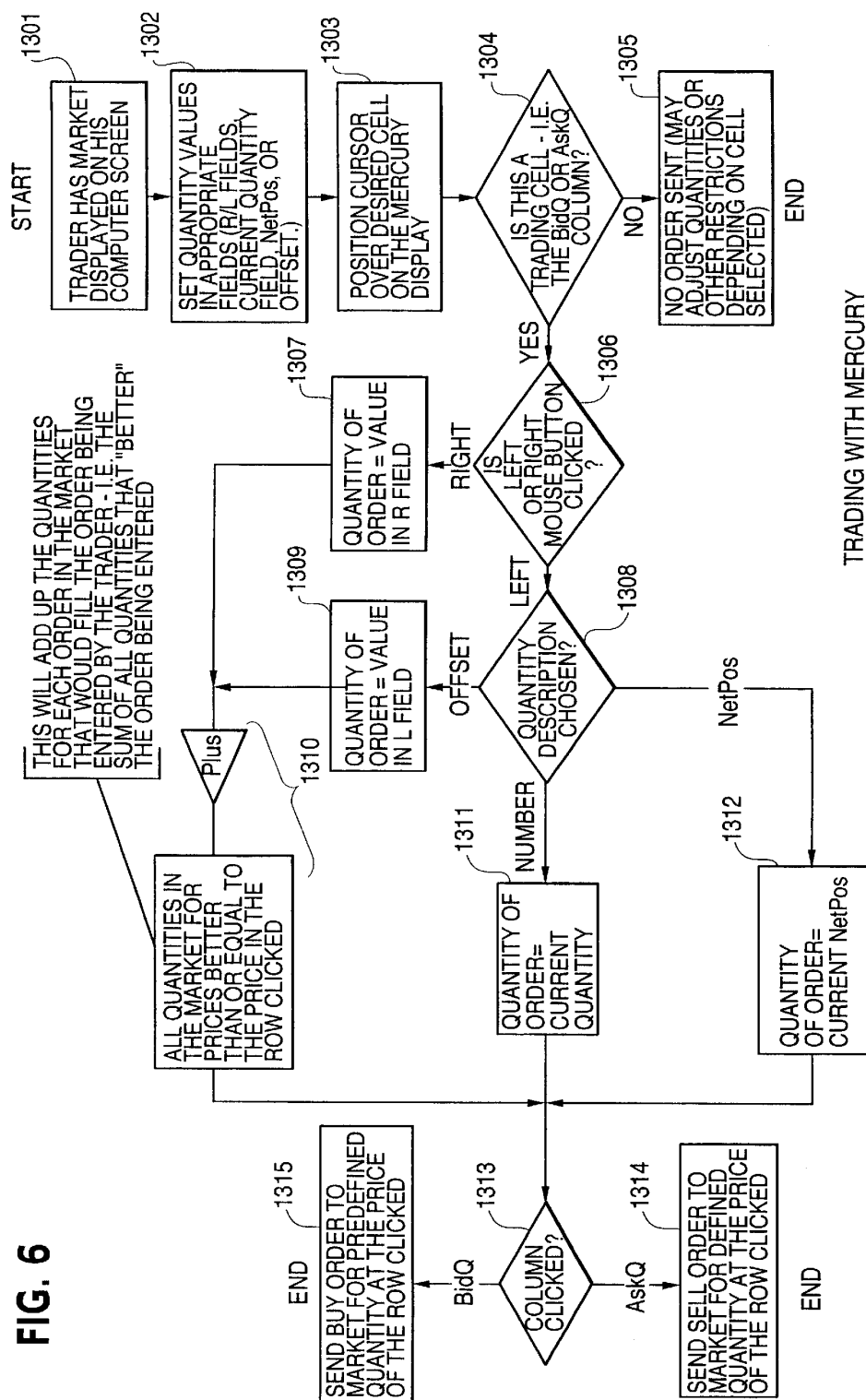
1201

1202

1203

1207

FIG. 6



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**CLICK BASED TRADING WITH INTUITIVE
GRID DISPLAY OF MARKET DEPTH**

This application is a divisional application of Ser. No. 09/590,692 filed Jun. 09, 2000 which claims benefit of 5
60/186,322, filed Mar. 2, 2000.

PRIORITY

The present application claims priority to a U.S. Provisional Patent Application entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

FIELD OF INVENTION

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

BACKGROUND OF THE INVENTION

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their

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screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of this information, the market will not accept the order. This input and output of information the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.

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SUMMARY OF THE INVENTION

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to place trade orders quickly and efficiently. A commodity's market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

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In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user's single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This "translation" function is described below with reference to FIG. 1. An applications program interface ("TT API" as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client's active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, 'while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of "Market Depth" and allow trader to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the "inside market" is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple

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algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid can be done by any technique known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also chose how far into the market depth to display on his screen. FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 09/589,751, filed on Jun. 9, 2000, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2–5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2–5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market–row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDHO". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to

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receive the data from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (Last Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity added at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of, the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

TABLE I

Abbreviations.			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Month	Expiration Month/Year	TheoBid	Theoretical Bid Price
Bid Mbr(1)	Bid Member ID	TheoAsk	Theoretical Ask Price
WkBuys(2)	Working Buys for entire Group ID	Qact	Quote Action (Sends individual quotes)
BidQty	Bid Quantity	BQQ	Test Bid Quote Quantity
ThreshBid(6)	Threshold Bid Price	BQP	Test Bid Quote Price
BidPrc	Bid Price	Mkt BQQ	Market Bid Quote Quantity
Bid Qty Accum	Accumulated Bid Quantity	Mkt BQP	Market Bid Quote Price
BidPrc Avg	Bid Price Average	Quote	Checkbox activates/deactivates contract for quoting
AskPrc Avg	Ask Price Average	Mkt AQQ	Market Ask Quote Quantity
AskQty Accum	Accumulated Ask Quantity	Mkt AQP	Market Ask Quote Price
AskPrc	Ask Price	AQP	Ask Quote Price
ThreshAsk(6)	Threshold Ask Price	AQQ	Ask Quote Quantity
AskQty	Ask Quantity	Imp BidQty(5)	Implied Bid Quantity
WkSells(2)	Working Sells for entire Group ID	Imp BidPrc(5)	Implied Bid Price
Ask Mbr(1)	Ask Member ID	Imp AskQty(5)	Implied Ask Quantity
NetPos	Net Position	Imp AskPrc(5)	Implied Ask Price
FFNetPos	Fast Fill Net Position	Gamma(3)	Change in Delta given 1 pt change in underlying
LastPrc	Last Price	Delta (3)	Change in price given 1 pt change in underlying
LastQty	Last Quantity	Vola (3)	Percent volatility
Total	Total Traded Quantity	Vega (3)	Price change given 1% change in Vola
High	High Price	Rhop (3)	Price change given 1% change in interest rate

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TABLE I-continued

Abbreviations.			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Low	Low Price	Theta(3)	Price change for every day that elapses
Open	Opening Price	Click Trd	Activate/deactivate click trading by contract
Close	Closing Price	S (Status)	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading
Chng TheoPr	Last Price-Last Close Theoretical Price	Expiry	Expiration Month/Year

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As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices decrease. Ask prices also descend the market grid as these prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column 1003 labeled BidQ and ask quantities are in column 1004 labeled AskQ. The representative ticks from prices for the given commodity are shown in column 1005. The column, does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). In the example shown, the inside market, cells 1020, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the

Bid and Ask columns however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column 1006 shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column 1001 labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells 1007, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that no orders are entered or working at that price. In cells 1008, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column 1002. For example, "10:48:44" in cell 1009 shows the actual time of day. The L and R fields in cell 1010 indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell 1011, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell 1012, "X 10", displays the Net Quantity, the current position of the trader on the chosen contract. The number "10" represents the trader's buys minus sells. Cell 1013 is the "Current Quantity"; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells 1014. These buttons increase the current quantity by the indicated amount; for example, "10" will increase it by 10; "1H" will increase it by 100; "1K" will increase it by 1000. Cell 1015 is the Clear button; clicking this button will clear the Current Quantity field. Cell 1016 is the Quantity Description; this is a pull down menu allowing the trader to choose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing "Offset" in this field will enable the L/R buttons of cell 1010. Choosing "NetPos" in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell 1017 are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell 1018 is used to invoke Net 0; clicking this button will reset the Net Quantity

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(cell **1011**) to zero. Cell **1019** is used to invoke Net Real; clicking this button will reset the Net Quantity (cell **10 11**) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3 but at a later interval where the inside market, cells **1101**, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends, and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market, might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, **1021**, below the "Net Real" button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as the market ascends and descends the vertical Mercury display shown in FIGS. 3 and 4, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity, Q_a =Total of all quantities in AskQ column at an equal or better price than P, Q_b =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order—sent to market.

Any order entered using right mouse button

$$Bo=(Q_a+R)P \quad (\text{Eq. 1})$$

If BidQ field clicked.

$$So=(Q_b+R)P \quad (\text{Eq. 2})$$

If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo=(Q_a+L)P \quad (\text{Eq. 3})$$

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If BidQ field clicked.

$$So=(Q_b+L)P \quad (\text{Eq. 4})$$

If AskQ field clicked.

If "number" mode chosen in Quantity Description field then:

$$Bo=QP \quad (\text{Eq. 5})$$

$$So=QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo=NP \quad (\text{Eq. 7})$$

$$So=NP \quad (\text{Eq. 8})$$

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. 5, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the 18 in the BidQ column **1201** will send an order to market to buy 17 lots (quantity #chosen on the Quantity Description pull down menu cell **1204**) of the commodity at a price of 89 (the corresponding price in the Prc column **1203**). Similarly, a left click on the 20 in the AskQ column **1202** will send an order to market to sell 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field **1205**. Thus, a right click in the AskQ column **1202** in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column **1201** because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field **1205**.

Similarly, a right click in the BidQ column **1201** at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the game manner as above. In this example, though, there are no orders in the market that equal or better the chosen price—there are no quantities in the AskQ column **1202** that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field **1204**

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will be calculated in the same way as above, but the quantity in the L field 1206 will be added instead of the quantity in the R field 1205. Thus, a left click in the BidQ column 1201 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 1202 because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field 1206.

The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 1202 in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field 1204, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 1204.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 1207. This allows a trader to exit the market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column 1208 will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step 1301, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step 1302, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step 1303, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step 1304, the system determines whether the cell clicked is a tradable cell (i.e. in the AskQ column or BidQ column). If not, then in step 1305, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step 1306, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step 1307, the system will use the quantity in the R field when it

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determines the total quantity of the order in step 1310. If the left button was clicked, then in step 1308, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step 1309, will use the quantity in the L field when it determines the total quantity of the order in step 1310. If NetPos was chosen, then the system, in step 1312, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step 1311, the system will determine that the total quantity for the trade order will be the current quantity entered. In step 1310, the system will determine that the total quantity for the trade order will be the value of the R field (if step 1307 was taken) or the value of the L field (if step 1309 was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps 1310, 1311 or 1312, the system, in step 1313, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step 1314, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step 1315, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

We claim:

1. A method for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the method comprising:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input

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device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

2. The method of claim 1 wherein the bid and ask display regions and the order entry region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.

3. The method of claim 1 wherein the bid and ask display regions and the order entry region are oriented vertically.

4. The method of claim 1 wherein the bid and ask display regions and the order entry region are oriented horizontally.

5. The method of claim 1 wherein one of the plurality of locations of bid display region comprises a blank region in which there is no first indicator displayed.

6. The method of claim 1 wherein one of the plurality of locations of the ask display region comprises a blank region in which there is no first indicator displayed.

7. The method of claim 1 comprising the step of displaying at least a portion of the common static price axis in a price display region.

8. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region comprise columns with a plurality of cells that are displayed as a grid such that the cells of each column are aligned.

9. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region are oriented vertically.

10. The method of claim 7 wherein the bid display region, the ask display region, the order entry region and the price display region are oriented horizontally.

11. The method of claim 1 further comprising the steps of: dynamically displaying a third indicator at one of the plurality of locations in the bid display region, the third indicator representing quantity associated with at least one order to buy the commodity at a price different than the highest bid price currently available in the market; and

dynamically displaying a fourth indicator at one of the plurality of locations in the ask display region, the fourth indicator representing quantity associated with at least one order to sell the commodity at a price different than the lowest ask price currently available in the market.

12. The method of claim 11 wherein a location of the plurality of locations of the bid display region comprises a blank region in which there is no first or third indicator displayed.

13. The method of claim 1 wherein a location of the plurality of locations of the ask display region comprises a blank region in which there is no second or fourth indicator displayed.

14. The method of claim 1 wherein the order entry region comprises:

a bid order entry region comprising a plurality of locations for receiving commands to send buy orders, each location corresponding to a price level along the common static price axis; and

an ask order entry region comprising a plurality of locations for receiving commands to send sell orders, each location corresponding to a price level along the common static price axis.

15. The method of claim 14 wherein the bid order entry region overlaps with the bid display region and the ask order entry region overlaps with the ask display region.

16. The method of claim 1 further comprising dynamically displaying an entered order indicator in association with the price levels arranged along the common static price axis.

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17. The method of claim 16 wherein the entered order indicator is displayed in an entered order region.

18. The method of claim 1 further comprising dynamically displaying a last trade indicator in association with the common static price axis.

19. The method of claim 18 wherein the last trade indicator is displayed in a last trade region.

20. The method of claim 1 further comprising the steps of: displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

21. The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

22. The method of claim 1 further comprising the steps of: displaying the first indicator at a first location associated with a particular price level on the common static price axis; and

repositioning the common static price axis such that the first indicator is displayed at a second location associated with the particular price level on the common static price axis.

23. The method of claim 1 further comprising the steps of: displaying the second indicator at a first location associated with a particular price level on the common static price axis; and

repositioning the common static price axis such that the second indicator is displayed at a second location associated with the particular price level on the common static price axis.

24. The method of claim 1 wherein the bid and ask display regions are displayed in different colors.

25. The method of claim 1 wherein the first and second indicators are displayed in different colors.

26. The method of claim 1 wherein the bid and ask display regions are displayed in a window further comprising centering the display of the first and second indicators in the window upon receipt of a centering instruction.

27. A computer readable medium having program code recorded thereon for execution on a computer for displaying market information relating to and facilitating trading of a commodity being traded in an electronic exchange having an inside market with a highest bid price and a lowest ask price on a graphical user interface, the program code causing a machine to perform the following method steps:

dynamically displaying a first indicator in one of a plurality of locations in a bid display region, each location in the bid display region corresponding to a price level along a common static price axis, the first indicator representing quantity associated with at least one order to buy the commodity at the highest bid price currently available in the market;

dynamically displaying a second indicator in one of a plurality of locations in an ask display region, each location in the ask display region corresponding to a price level along the common static price axis, the second indicator representing quantity associated with at least one order to sell the commodity at the lowest ask price currently available in the market;

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displaying the bid and ask display regions in relation to fixed price levels positioned along the common static price axis such that when the inside market changes, the price levels along the common static price axis do not move and at least one of the first and second indicators moves in the bid or ask display regions relative to the common static price axis;

displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the common static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

28. The method of claim **11** wherein the first and third indicators are displayed in locations of the bid display region that are arranged along an axis which is parallel to the common static price axis.

29. The method of claim **11** wherein the second and fourth indicators are displayed in locations of the ask display region that are arranged along an axis which is parallel to the common static price axis.

30. The method of claim **11** comprising the steps of:

displaying the first indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the first indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

31. The method of claim **30** wherein the third and fourth indicators remain in the same location in the bid and ask display regions, respectively, before and after the first indicator is displayed at the second location.

32. The method of claim **31** wherein each location of the bid display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price.

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33. The method of claim **11** comprising the steps of:

displaying the second indicator at a first location associated with a first price level on the common static price axis at a first time; and

displaying the second indicator at a second location associated with a different price level on the common static price axis at a second time subsequent to the first time.

34. The method of claim **33** wherein the third and fourth indicators remain in the same location in the bid and ask display regions, respectively, before and after the second indicator is displayed at the second location.

35. The method of claim **34** wherein each location of the bid display region corresponds to a different price level along the common static price axis and each location of the ask display region corresponds to a different price level along the common static price.

36. The method of claim **1** wherein the bid and ask display regions are displayed separately.

37. The method of claim **1** wherein the first and second indicators are based on an exchange order book and wherein the price levels along the common static price axis do not move in response to the addition of a price to the exchange order book, the additional price comprising a price for which there is a corresponding displayed location in at least one of the bid and ask display regions.

38. The method of claim **37** wherein the price levels along the common static price axis do not move in response to the removal of a price from the exchange order book, the removed price comprising a price for which there is a corresponding displayed location in at least one of the bid and ask display regions.

39. The method of claim **1** wherein the first and second indicators are based on an exchange order book and the price levels along the common static price axis never move in response to a price change in the exchange order book relating to a price which corresponds to a displayed location in at least one of the bid and ask display regions.

40. The method of claim **1** the plurality of parameters comprises a price and type of order.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,766,304 B2
DATED : July 20, 2004
INVENTOR(S) : Gary Allan Kemp II, Jens-Uwe Schluetter and Harris Brumfield

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page,

Item [56], **References Cited**, U.S. PATENT DOCUMENTS, add the following:

-- 4,903,201	A	2/1990	Wagner
5,101,353	A	3/1992	Lupien et al.
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2002/0138401 A1		9/2002	Allen et al. --

FOREIGN PATENT DOCUMENTS, add the following:

-- WO WO 95/35005 9/1995 --

Column 14,

Line 64, the word "Static" should be -- static --.

Column 15,

Line 26, after "claim 11" add the word -- further --.

Column 16,

Line 1, after "claim 11" add the word -- further --.

Line 10, the word "an" should be -- and --.

Line 40, after "claim 1" add -- wherein --.

Signed and Sealed this

Sixteenth Day of November, 2004



JON W. DUDAS
Director of the United States Patent and Trademark Office



US006766304C1

(12) **EX PARTE REEXAMINATION CERTIFICATE** (6739th)
United States Patent
Kemp, II et al.

(10) **Number:** **US 6,766,304 C1**(45) **Certificate Issued:** **Mar. 31, 2009**(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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(75) Inventors: **Gary Allan Kemp, II**, Winnetka, IL (US); **Jens-Uwe Schluetter**, Evanston, IL (US); **Harris Brumfield**, Chicago, IL (US)

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(73) Assignee: **Trading Technologies International, Inc.**, Evanston, IL (US)

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No. 90/008,577, May 25, 2007

Reexamination Certificate for:

Patent No.: **6,766,304**
 Issued: **Jul. 20, 2004**
 Appl. No.: **09/894,637**
 Filed: **Jun. 27, 2001**

Certificate of Correction issued Nov. 16, 2004.

Related U.S. Application Data

(62) Division of application No. 09/590,692, filed on Jun. 9, 2000, now Pat. No. 6,772,132.

(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

(51) **Int. Cl.**
G06Q 40/00 (2006.01)
G06F 3/048 (2006.01)

(52) **U.S. Cl.** **705/36 R; 705/35; 715/814**

(58) **Field of Classification Search** None
 See application file for complete search history.

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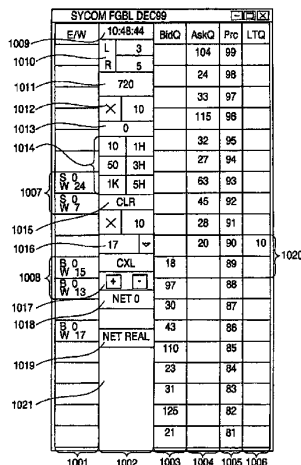
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(57) ABSTRACT

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.



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EX PARTE
REEXAMINATION CERTIFICATE
ISSUED UNDER 35 U.S.C. 307

NO AMENDMENTS HAVE BEEN MADE TO
THE PATENT

2
AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

5 The patentability of claims **1-40** is confirmed.

* * * * *



US006772132B1

(12) **United States Patent**
Kemp, II et al.

(10) **Patent No.:** **US 6,772,132 B1**
 (45) **Date of Patent:** **Aug. 3, 2004**

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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(75) Inventors: **Gary Allan Kemp, II**, Winnetka, IL (US); **Jens-Uwe Schluetter**, Evanston, IL (US); **Harris Brumfield**, Chicago, IL (US)

(List continued on next page.)

(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 245 days.

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(21) Appl. No.: **09/590,692**

(22) Filed: **Jun. 9, 2000**

Related U.S. Application Data

(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

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(51) **Int. Cl.**⁷ **G06F 17/60**

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(58) **Field of Search** **705/35, 36, 37, 705/10, 14; 345/814**

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Primary Examiner—Richard Weisberger

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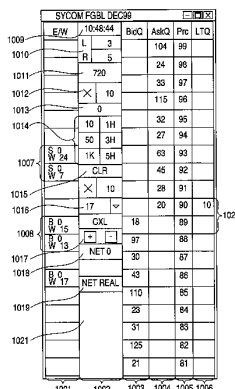
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(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

56 Claims, 6 Drawing Sheets



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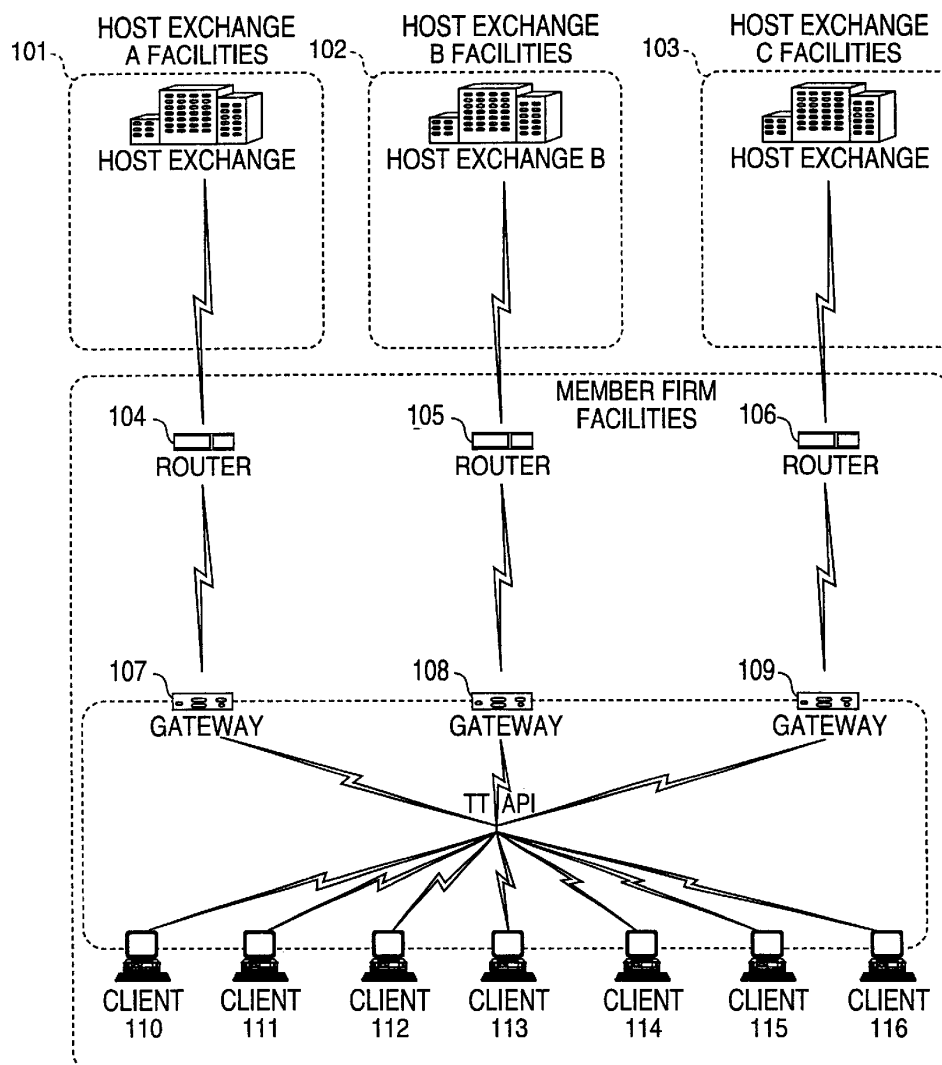
Aug. 3, 2004

Sheet 1 of 6

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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



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FIG. 2

	201	202	203	204	205				
	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

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FIG. 3

SYCOM FGBL DEC99					
E/W		10:48:44	BidQ	AskQ	Prc LTQ
1009	L	3		104	99
1010	R	5		24	98
1011	720			33	97
1012	×	10		115	96
1013	0			32	95
1014	10	1H		27	94
	50	3H		63	93
1007	S 0 W 24	1K 5H		45	92
	S 0 W 7	CLR		28	91
1015	×	10		20	90
1016	17	▽		18	89
1008	B 0 W 15	CXL	18		88
	B 0 W 13	+ -	97		87
1017	NET 0		30		86
1018	B 0 W 17	NET REAL	43		85
1019			110		84
1021			23		83
			31		82
			125		81
			21		

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FIG. 4

SYCOM FGBL DEC99							[-][][X]	
E/W	10:48:44		BidQ	AskQ	Prc	LTQ	} 1101	
	L	3		104	99			
	R	5		24	98			
	720			33	97			
	X	10		115	96			
	0			32	95			
	10	1H		27	94			
	50	3H		63	93	10		
S 10 W 14	1K	5H		43	92			
	CLR		125		91			
	X	10	97		90			
	17	▼	18		89			
B 0 W 15	CXL		97		88			
B 0 W 13	+	-	30		87			
	NET 0		43		86			
B 0 W 17	NET REAL		110		85			
			23		84			
			31		83			
			125		82			
			21		81			

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FIG. 5

SYCOM FGBL DEC99						[-][+][X]	
E/W	10:48:44		BidQ	AskQ	Prc	LTQ	
1206	L	3		104	99		
	R	5		24	98		
1205	720			33	97		
	X	10		115	96		
	0			32	95		
	10	1H		27	94		
	50	3H		63	93		
S 0 W 24	1K	5H		45	92		
S 0 W 7	CLR			28	91		
	X	10		20	90	10	
	17	▼		18	89		
1204	B 0 W 15	CXL	97		88		
	B 0 W 13	+ -	30		87		
	NET 0		43		86		
			110		85		
B 0 W 17	NET REAL		23		84		
			31		83		
			125		82		
			21		81		

1208

1201

1202

1203

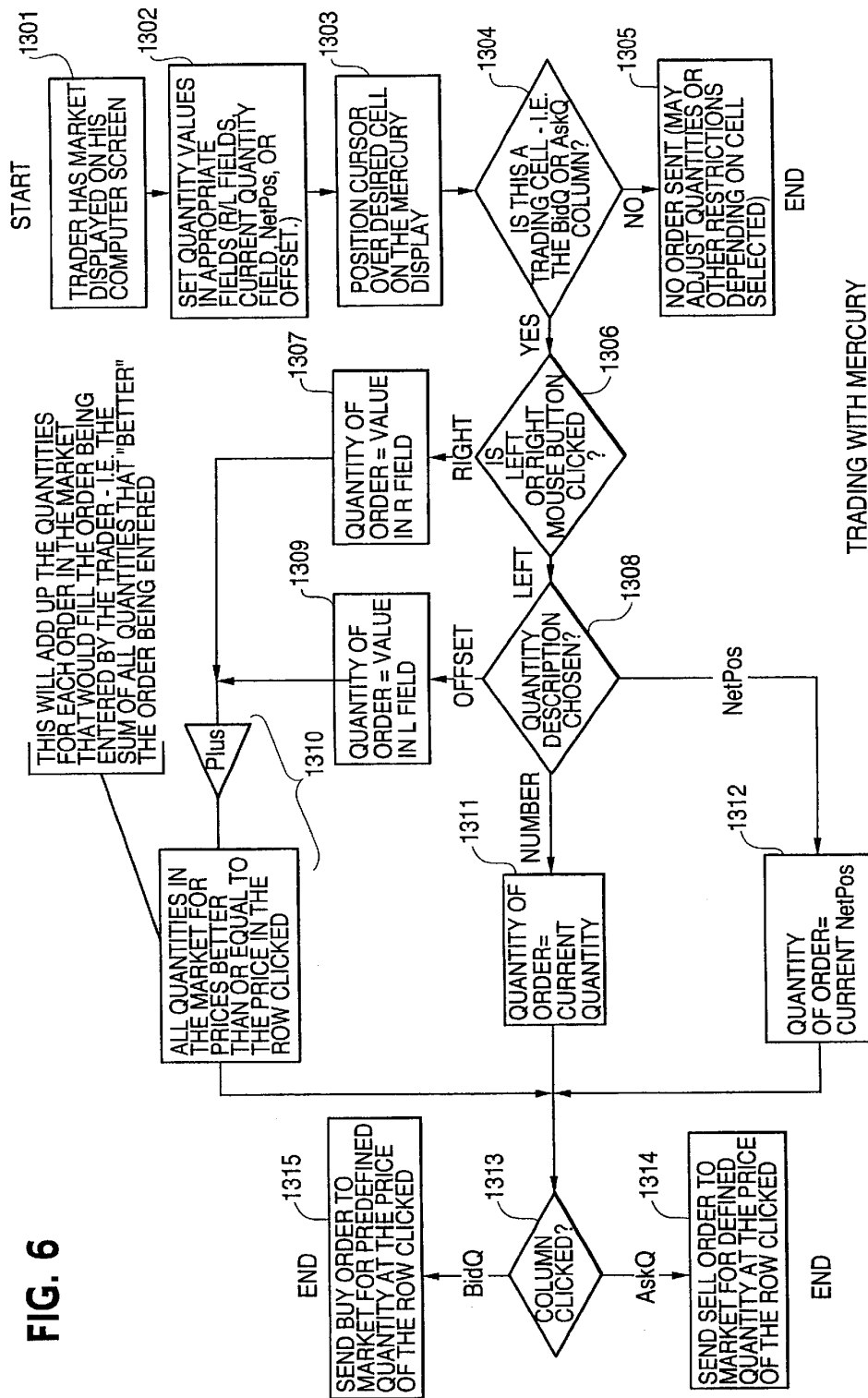
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**CLICK BASED TRADING WITH INTUITIVE
GRID DISPLAY OF MARKET DEPTH****PRIORITY**

The present application claims priority to a U.S. Provisional Patent Application No. 60/186,322 entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

FIELD OF INVENTION

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

BACKGROUND OF THE INVENTION

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

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The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of this information, the market will not accept the order. This input and output of information is the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. It fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.

SUMMARY OF THE INVENTION

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems

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and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The “Mercury” display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to place trade orders quickly and efficiently. A commodity’s market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive

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and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user’s single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges 101–103 connected through routers 104–106 to gateways 107–109. Multiple client terminals 110–116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107–109. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This “translation” function is described below with reference to FIG. 1. An applications program interface (“TT API” as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client’s active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of “Market Depth” and allow traders to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the “inside market” is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid can be done by any technique

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known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also chose how far into the market depth to display on his screen.

FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 09/589,751, filed on Jun. 9, 2000, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market—row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDHO". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to receive the data from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (Last Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity traded at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays

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reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

TABLE I

Abbreviations	
COLUMN	DESCRIPTION
Month	Expiration Month/Year
Bid Mbr ₍₁₎	Bid Member ID
WrkBys ₍₂₎	Working Buys for entire Group ID
BidQty	Bid Quantity
ThrshBid ₍₆₎	Threshold Bid Price
BidPrc	Bid Price
Bid Qty Accum	Accumulated Bid Quantity
BidPrc Avg	Bid Price Average
AskPrc Avg	Ask Price Average
AskQty Accum	Accumulated Ask Quantity
AskPrc	Ask Price
ThrshAsk ₍₆₎	Threshold Ask Price
AskQty	Ask Quantity
WrkSells ₍₂₎	Working Sells for entire Group ID
Ask Mbr ₍₁₎	Ask Member ID
NetPos	Net Position
FFNetPos	Fast Fill Net Position
LastPrc	Last Price
LastQty	Last Quantity
Total	Total Traded Quantity
High	High Price
Low	Low Price
Open	Opening Price
Close	Closing Price
Chng	Last Price-Last Close
TheoPrc	Theoretical Price
TheoBid	Theoretical Bid Price
TheoAsk	Theoretical Ask Price
QAct	Quote Action (Sends individual quotes)
BQQ	Test Bid Quote Quantity
BQP	Test Bid Quote Price
Mkt BQQ	Market Bid Quote Quantity
Mkt BQP	Market Bid Quote Price
Quote	Checkbox activates/deactivates contract for quoting
Mkt AQQ	Market Ask Quote Quantity
Mkt AQP	Market Ask Quote Price
AQP	Ask Quote Price
AQQ	Ask Quote Quantity
Imp BidQty ₍₅₎	Implied Bid Quantity
Imp BidPrc ₍₅₎	Implied Bid Price
Imp AskQty ₍₅₎	Implied Ask Quantity
Imp AskPrc ₍₅₎	Implied Ask Price
Gamma ₍₃₎	Change in Delta given 1 pt change in underlying
Delta ₍₃₎	Change in price given 1 pt change in underlying
Vola ₍₃₁₎	Percent volatility
Vega ₍₃₎	Price change given 1% change in Vola
Rho ₍₃₎	Price change given 1% change in interest rate
Theta ₍₃₎	Price change for every day that elapses
Click Trd	Activate/deactivate click trading by contract
S(Status)	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading
Expiry	Expiration Month/Year

As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or

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horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices decrease. Ask prices also descend the market grid as these prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column **1003** labeled BidQ and ask quantities are in column **1004** labeled AskQ. The representative ticks from prices for the given commodity are shown in column **1005**. The column does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). In the example shown, the inside market, cells **1020**, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the Bid and Ask columns however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column **1006** shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column **1001** labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells **1007**, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that no orders are entered or working at that price. In cells **1008**, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of

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the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column **1002**. For example, "10:48:44" in cell **1009** shows the actual time of day. The L and R fields in cell **1010** indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell **1011**, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell **1012**, "X 10", displays the Net Quantity, the current position of the trader on the chosen contract. The number "10" represents the trader's buys minus sells. Cell **1013** is the "Current Quantity"; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells **1014**. These buttons increase the current quantity by the indicated amount; for example, "10" will increase it by 10; "1H" will increase it by 100; "1K" will increase it by 1000. Cell **1015** is the Clear button; clicking this button will clear the Current Quantity field. Cell **1016** is the Quantity Description; this is a pull down menu allowing the trader to choose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing "Offset" in this field will enable the L/R buttons of cell **1010**. Choosing "NetPos" in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell **1017** are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell **1018** is used to invoke Net 0; clicking this button will reset the Net Quantity (cell **1011**) to zero. Cell **1019** is used to invoke Net Real; clicking this button will reset the Net Quantity (cell **1011**) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3 but at a later interval where the inside market, cells **1101**, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, **1021**, below the "Net Real" button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as the market ascends and descends the vertical Mercury display shown in FIGS. 3 and 4, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to

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dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity, Q_a =Total of all quantities in AskQ column at an equal or better price than P, Q_b =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order sent to market.

Any order entered using right mouse button

$$Bo=(Q_a+R)P \quad (\text{Eq. 1})$$

If BidQ field clicked.

$$So=(Q_b+R)P \quad (\text{Eq. 2})$$

If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo=(Q_a+L)P \quad (\text{Eq. 3})$$

If BidQ field clicked.

$$So=(Q_b+L)P \quad (\text{Eq. 4})$$

If AskQ field clicked.

If "number" mode chosen in Quantity Description field then:

$$Bo=QP \quad (\text{Eq. 5})$$

$$So=QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo=NP \quad (\text{Eq. 7})$$

$$So=NP \quad (\text{Eq. 8})$$

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. 5, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the 18 in the BidQ column 1201 will send an order to market to sell 17 lots (quantity # chosen on the Quantity Description pull down menu cell 1204) of the commodity at a price of 89 (the corresponding price in the Prc column

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1203). Similarly, a left click on the 20 in the AskQ column 1202 will send an order to market to buy 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field 1205. Thus, a right click in the AskQ column 1202 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column 1201 because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field 1205.

Similarly, a right click in the BidQ column 1201 at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price—there are no quantities in the AskQ column 1202 that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field 1204 will be calculated in the same way as above, but the quantity in the L field 1206 will be added instead of the quantity in the R field 1205. Thus, a left click in the BidQ column 1201 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 1202 because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field 1206.

The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 1202 in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field 1204, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 1204.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 1207. This allows a trader to exit the

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market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column **1208** will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step **1301**, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step **1302**, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step **1303**, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step **1304**, the system determines whether the cell clicked is a tradeable cell (i.e. in the AskQ column or BidQ column). If not, then in step **1305**, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step **1306**, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step **1307**, the system will use the quantity in the R field when it determines the total quantity of the order in step **1310**. If the left button was clicked, then in step **1308**, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step **1309**, will use the quantity in the L field when it determines the total quantity of the order in step **1310**. If NetPos was chosen, then the system, in step **1312**, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step **1311**, the system will determine that the total quantity for the trade order will be the current quantity entered. In step **1310**, the system will determine that the total quantity for the trade order will be the value of the R field (if step **1307** was taken) or the value of the L field (if step **1309** was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps **1310**, **1311** or **1312**, the system, in step **1313**, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step **1314**, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step **1315**, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

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We claim:

1. A method of placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, using a graphical user interface and a user input device, said method comprising:

setting a preset parameter for the trade order

displaying market depth of the commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including at least a portion of the bid and ask quantities of the commodity, the dynamic display being aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;

displaying an order entry region aligned with the static display prices comprising a plurality of areas for receiving commands from the user input devices to send trade orders, each area corresponding to a price of the static display of prices; and

selecting a particular area in the order entry region through single action of the user input device with a pointer of the user input device positioned over the particular area to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

2. A method of placing a trade order according to claim **1**, wherein said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and wherein said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

3. A method of placing a trade order according to claim **2**, wherein the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

4. A method of placing a trade order according to claim **2**, wherein the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

5. A method of placing a trade order according to claim **2**, wherein the trade order is for a quantity equal to a pre-determined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

6. A method of placing a trade order according to claim **2**, wherein said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second pre-determined value if a single action of a second type is taken.

7. A method of placing a trade order according to claim **2**, further comprising canceling said trade order in response to a subsequent single action of the user input device.

8. A computer readable medium having program code recorded thereon, for execution on a computer having a graphical user interface and a user input device, to place a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, comprising:

a first program code for setting a preset parameter for the trade order;

a second program code displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the

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commodity, including the bid and ask quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move in response to a change in the inside market;

a third program code for displaying an order entry region comprising a plurality of areas for receiving commands from the user input device to send trade orders, aligned with the static display of prices, each area corresponding to a price of the static display of prices; and

a fourth program code for receiving a command as a result of a selection of a particular area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the particular area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

9. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 8, further comprising program code for establishing that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

10. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, further comprising program code for establishing that the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

11. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, further comprising program code for establishing that the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

12. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, further comprising program code for establishing that the trade order is for a quantity equal to a pre-determined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

13. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 12, further comprising program code for establishing that said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second pre-determined value if a single action of a second type is taken.

14. A client system for placing a trade order for a commodity on an electronic exchange having an inside market with a highest bid price and a lowest ask price, the system comprising:

a parameter setting component for setting a preset parameter for the trade order;

a display device for displaying market depth of a commodity, through a dynamic display of a plurality of bids and a plurality of asks in the market for the commodity, including the bid and ask quantities of the commodity, aligned with a static display of prices corresponding thereto, wherein the static display of prices does not move when the inside market changes,

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and for displaying an order entry region aligned with the static display of prices, comprising a plurality of areas for receiving commands to send trade orders, each area corresponding to a price of the static display of prices;

a user input device for positioning a pointer thereof over an area in the order entry region; and

a trade order sending component for receiving a command as a result of a selection of the area in the order entry region by a single action of the user input device with a pointer of the user input device positioned over the area, to set a plurality of additional parameters for the trade order and send the trade order to the electronic exchange.

15. A client system for placing a trade order for a commodity according to claim 14, wherein said trade order sending component establishes that said trade order is a buy order if the position of the pointer at the time of said single action is within a bid order entry region and that said trade order is a sell order if the position of the pointer at the time of said single action is within an ask order entry region.

16. A client system for placing a trade order for a commodity according to claim 15, wherein said trade order sending component establishes that the trade order is for a pre-determined fixed quantity and for a price corresponding to the position of the pointer at the time of said single action.

17. A client system for placing a trade order for a commodity according to claim 15, wherein said trade order sending component establishes that the trade order is for a quantity equal to a current net position of the user in the commodity and for a price corresponding to the position of the pointer at the time of said single action.

18. A client system for placing a trade order for a commodity according to claim 15, wherein said trade order sending component establishes that the trade order is for a quantity equal to a predetermined fixed offset plus the sum of all quantities in the market at prices better than or equal to a price corresponding to the position of the pointer at the time of said single action and for a price corresponding to said position.

19. A client system for placing a trade order for a commodity according to claim 18, wherein said trade order sending component establishes that said offset is equal to a first pre-determined value if a single action of a first type is taken and said offset is equal to a second predetermined value if a single action of a second type is taken.

20. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in a vertical orientation.

21. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in a horizontal orientation.

22. A method according to claim 1, wherein a plurality of said displayed bids and asks in the market include bid and ask quantities of the commodity.

23. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said bids and asks in different colors.

24. A method according to claim 1, further comprising re-centering said prices corresponding to the bids and asks about an inside market price upon receipt of a re-centering instruction.

25. A method according to claim 1, further comprising dynamically displaying working orders in alignment with the prices corresponding thereto.

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26. A method of displaying according to claim 1, further comprising dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

27. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices in at least one direction in numerical order.

28. A method according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises displaying said statically displayed prices along a single line in numerical order.

29. A method of displaying according to claim 1, wherein said displaying the market depth of a commodity traded in a market further comprises dynamically displaying a last traded quantity for said commodity in alignment with the price corresponding thereto.

30. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed bids, asks and prices are oriented vertically.

31. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed bids, asks and prices are oriented horizontally.

32. A computer readable medium according to claim 8, further comprising program code to ensure that a plurality of bids and asks in the market include bid and ask quantities of the commodity.

33. A computer readable medium according to claim 8, further comprising program code to ensure that bids and asks are displayed in different colors.

34. A computer readable medium according to claim 8, further comprising program code to ensure that said displayed prices corresponding to the bids and asks are re-centered about an inside market price upon receipt of a re-centering instruction.

35. A computer readable medium according to claim 8, further comprising program code for dynamically displaying working orders in alignment with the prices corresponding thereto.

36. A computer readable medium according to claim 8, further comprising program code for dynamically displaying entered orders in alignment with the prices corresponding thereto, wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

37. A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed in at least one direction in numerical order.

38. A computer readable medium according to claim 8, further comprising program code to ensure that said statically displayed prices are displayed along a single line in numerical order.

39. A computer readable medium according to claim 8, further comprising program code for dynamically displaying a last traded quantity for said commodity in alignment with the price corresponding thereto.

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40. A client system according to claim 14, wherein said displays are oriented vertically.

41. A client system according to claim 14, wherein said displays are oriented horizontally.

42. A client system according to claim 14, wherein said displays of the pluralities of bids and asks in the market include bid and ask quantities of the commodity.

43. A client system according to claim 14, wherein said displays are displayed in different colors.

44. A client system according to claim 14, wherein said display of prices corresponding to the bids and asks is re-centered about an inside market price upon re-centering instruction from a user.

45. A client system according to claim 14, further comprising a display of working orders displayed in alignment with the prices corresponding thereto.

46. A client system according to claim 14, wherein said display device displays entered orders in alignment with the prices corresponding thereto and wherein said entered orders indicate a quantity of said commodity for which a trader's orders have been filled at said corresponding prices.

47. A client system according to claim 14, wherein said static display of prices is displayed in at least one direction in numerical order.

48. A client system according to claim 14, wherein said static display of prices is displayed along a single line in numerical order.

49. A client system according to claim 14, wherein said display device displays a last traded quantity for said commodity in alignment with the price corresponding thereto.

50. The method of claim 2, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

51. A computer readable medium having program code recorded thereon, for execution on a computer to place a trade order according to claim 9, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

52. A client system for placing a trade order for a commodity according to claim 15, wherein the bid order entry region overlaps with a bid display region and the ask order entry region overlaps with an ask display region.

53. The method of claim 1 wherein the market depth is based on an exchange order book and wherein the static display of prices does not move in response to the addition of a price to the exchange order book, the additional price comprising a displayed price.

54. The method of claim 53 wherein the static display of prices does not move in response to the removal of a price from the exchange order book, the removed price comprising a displayed price.

55. The method of claim 1 wherein the market depth is based on an exchange order book and the static display of prices never moves in response to a price change in the exchange order book relating to a price which is displayed.

56. The method of claim 1 wherein the plurality of additional parameters comprises a price and type of order.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,772,132 B1
DATED : August 3, 2004
INVENTOR(S) : Gary Allan Kemp II, Jens-Uwe Schluetter and Harris Brumfield

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page,

Item [56], **References Cited**, OTHER PUBLICATIONS, after the last entry, insert
-- Patsystems News Release, PATSYSTEMS LAUNCHES J TRADER,
November 06, 2001 --.

Column 9,


Line 65, delete "sell" and insert -- buy --.

Column 10,

Line 2, delete "buy" and insert -- sell --.

Signed and Sealed this

Second Day of August, 2005

A handwritten signature in black ink, reading "Jon W. Dudas", is written over a rectangular area with a light gray dotted background.

JON W. DUDAS
Director of the United States Patent and Trademark Office



US006772132C1

(12) **EX PARTE REEXAMINATION CERTIFICATE** (6740th)
United States Patent
Kemp, II et al.

(10) **Number:** **US 6,772,132 C1**(45) **Certificate Issued:** **Mar. 31, 2009**(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

2003/0097325 A1 5/2003 Friesen et al.

FOREIGN PATENT DOCUMENTS(75) Inventors: **Gary Allan Kemp, II**, Winnetka, IL (US); **Jens-Uwe Schluetter**, Evanston, IL (US); **Harris Brumfield**, Chicago, IL (US)

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(73) Assignee: **Trading Technologies International, Inc.**, Evanston, IL (US)**OTHER PUBLICATIONS****Reexamination Request:**

No. 90/008,576, May 25, 2007

Reexamination Certificate for:

Patent No.: **6,772,132**
 Issued: **Aug. 3, 2004**
 Appl. No.: **09/590,692**
 Filed: **Jun. 9, 2000**

Certificate of Correction issued Aug. 2, 2005.

Related U.S. Application Data

(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

(51) **Int. Cl.**
G06Q 40/00 (2006.01)
G06F 3/048 (2006.01)

(52) **U.S. Cl.** **705/36 R; 705/35; 705/10; 705/14; 715/814**

(58) **Field of Classification Search** None
 See application file for complete search history.

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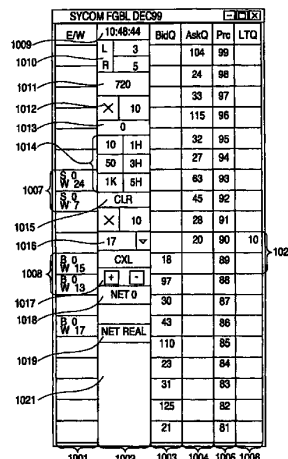
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Primary Examiner—Jeanne M. Clark(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.



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EX PARTE
REEXAMINATION CERTIFICATE
ISSUED UNDER 35 U.S.C. 307

NO AMENDMENTS HAVE BEEN MADE TO
THE PATENT

2
AS A RESULT OF REEXAMINATION, IT HAS BEEN
DETERMINED THAT:

5 The patentability of claims **1-56** is confirmed.

* * * * *



US007533056B2

(12) **United States Patent**
Friesen et al.

(10) **Patent No.:** **US 7,533,056 B2**(45) **Date of Patent:** ***May 12, 2009**

(54) **USER INTERFACE FOR AN ELECTRONIC TRADING SYSTEM**

FOREIGN PATENT DOCUMENTS

EP 0 388 162 A2 * 3/1990

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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This patent is subject to a terminal disclaimer.

(57) **ABSTRACT**

(21) Appl. No.: **11/417,544**

(22) Filed: **May 3, 2006**

(65) **Prior Publication Data**

US 2006/0265318 A1 Nov. 23, 2006

Related U.S. Application Data

(63) Continuation of application No. 09/289,550, filed on Apr. 9, 1999, now Pat. No. 7,212,999.

(51) **Int. Cl.**
G06Q 40/00 (2006.01)

(52) **U.S. Cl.** **705/37; 705/35; 345/440.2**

(58) **Field of Classification Search** **705/35, 705/37; 345/440.2**

See application file for complete search history.

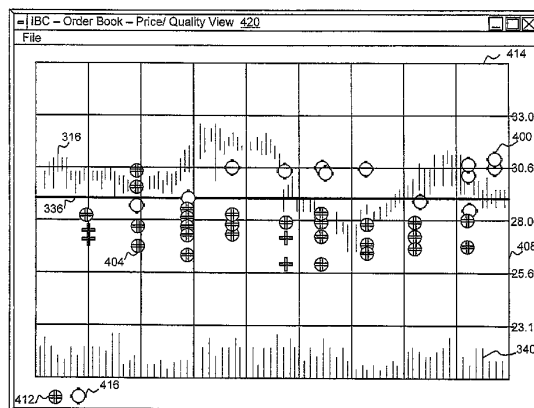
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A user interface for an electronic trading exchange is provided which allows a remote trader to view in real time bid orders, offer orders, and trades for an item, and optionally one or more sources of contextual data. Individual traders place orders on remote client terminals, and this information is routed to a transaction server. The transaction server receives order information from the remote terminals, matches a bid for an item to an offer for an item responsive to the bid corresponding with the offer, and communicates outstanding bid and offer information, and additional information (such as trades and contextual data) back to the client terminals. Each client terminal displays all of the outstanding bids and offers for an item, allowing the trader to view trends in orders for an item. A priority view is provided in which orders are displayed as tokens at locations corresponding to the values of the orders. The size of the tokens reflects the quantity of the orders. An alternate view positions order icons at a location which reflects the value and quantity of the order. Additionally, contextual data for the item is also displayed to allow the trader to consider as much information as possible while making transaction decisions. A pit panel view is also provided in which traders connected to the pit are represented by icons, and are displayed corresponding to an activity level of the trader.

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15 Claims, 11 Drawing Sheets

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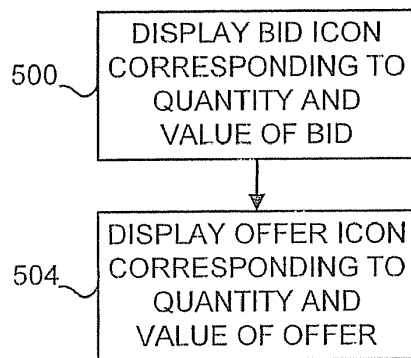
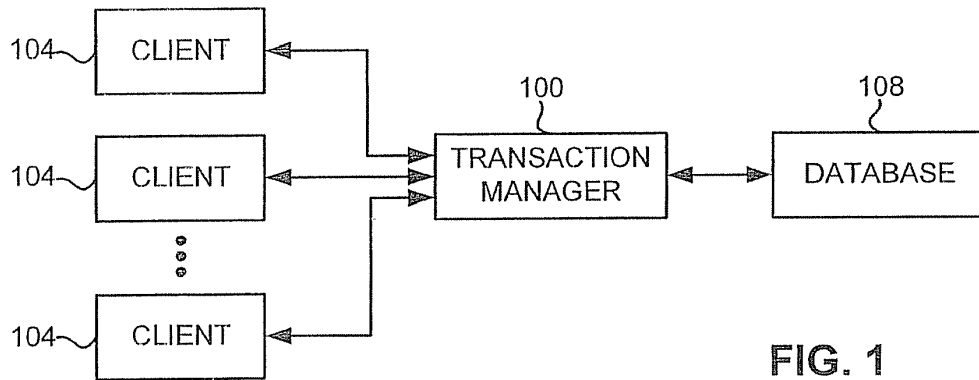
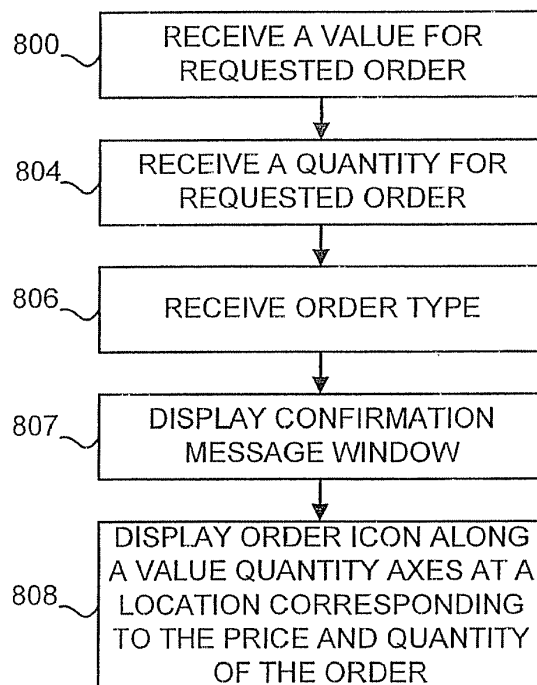


FIG. 8



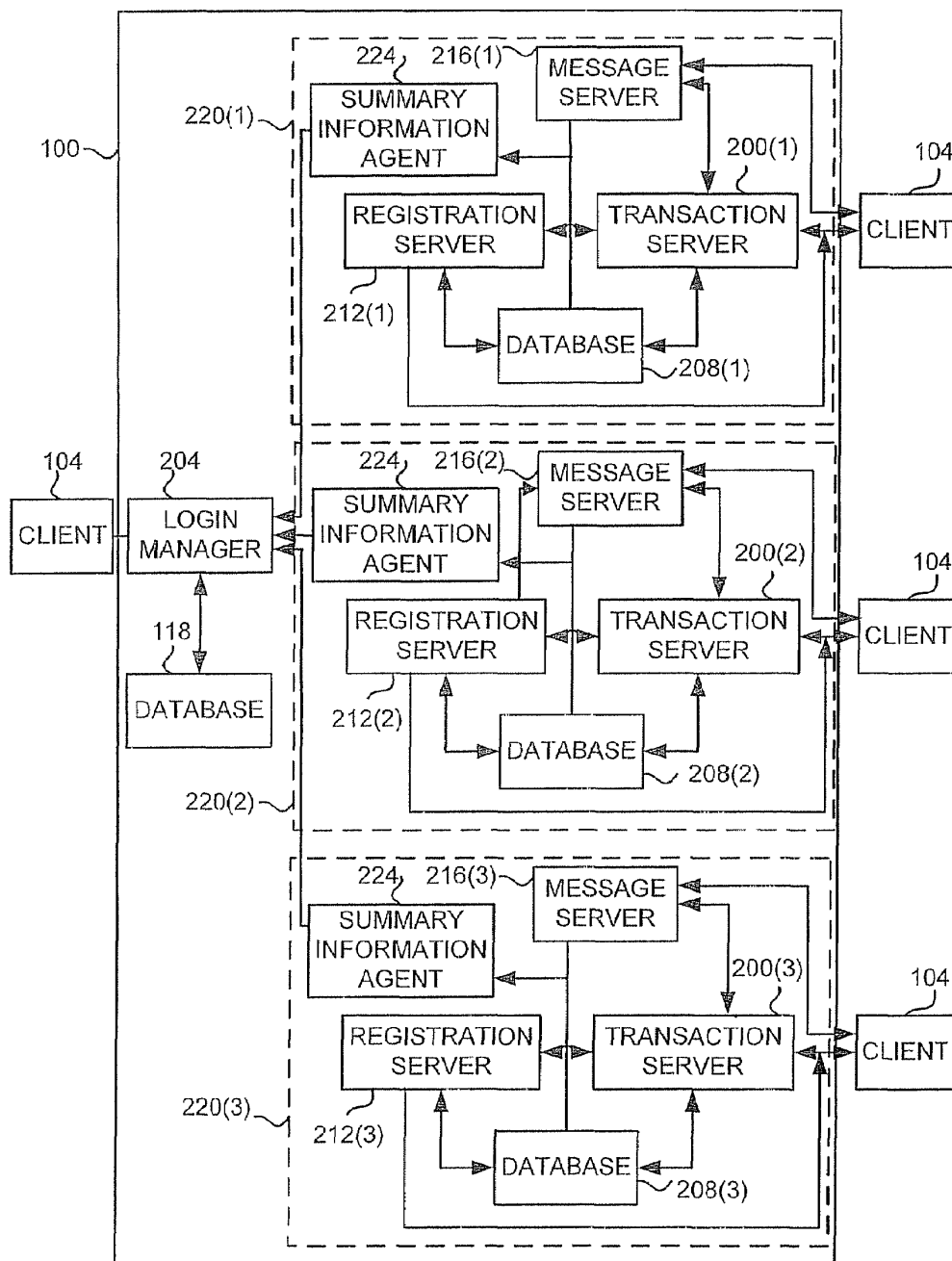


FIG. 2

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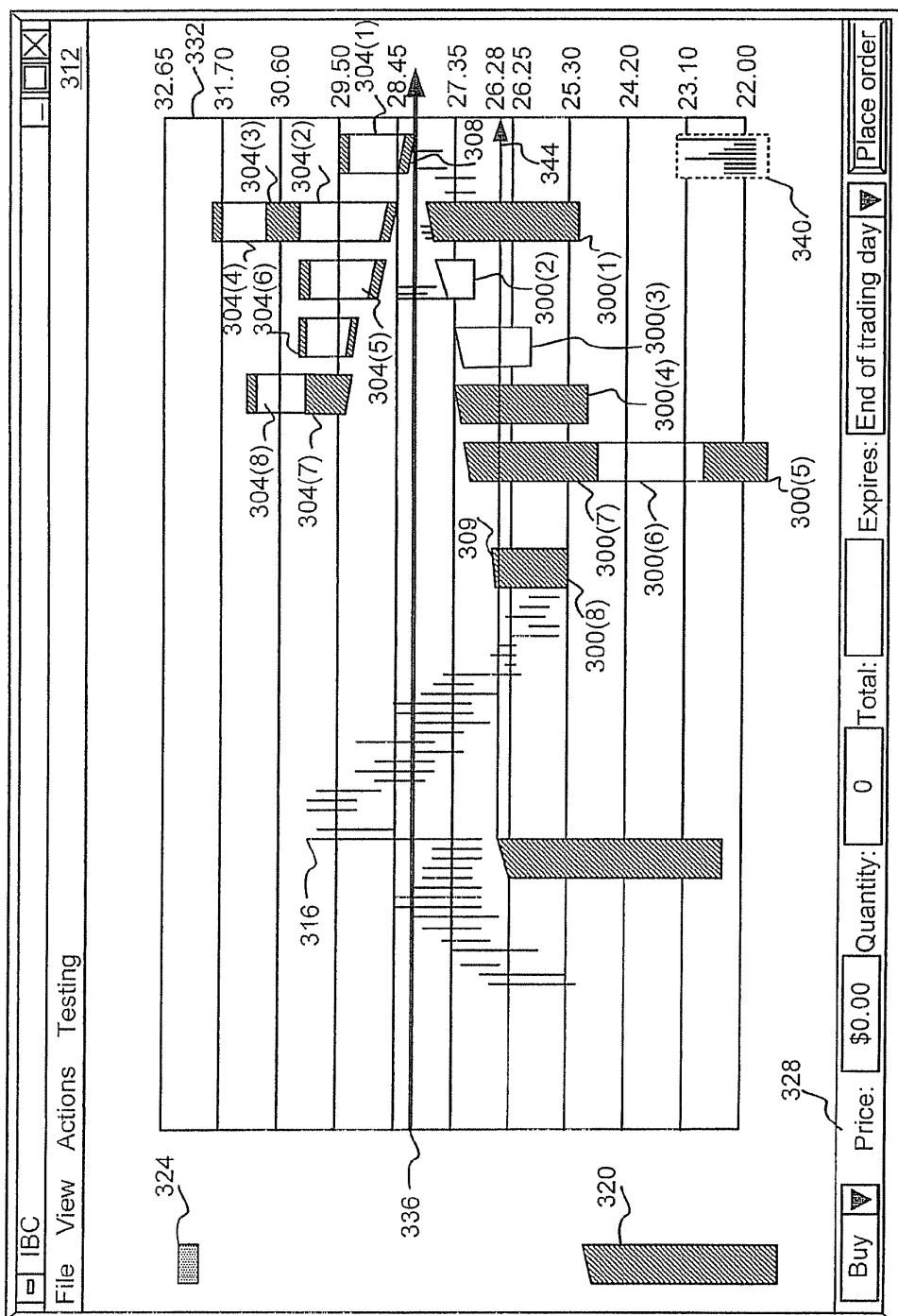


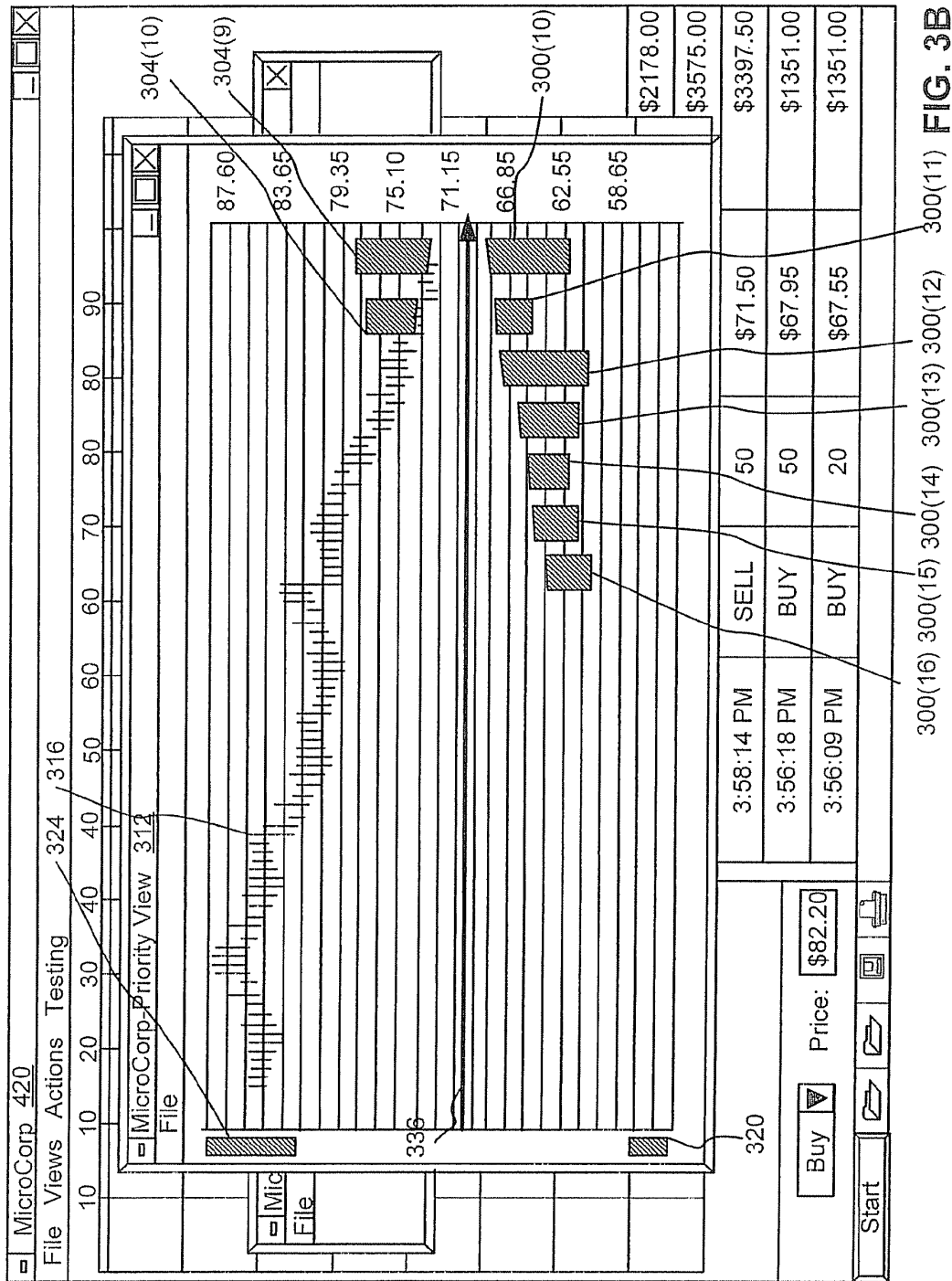
FIG. 3A

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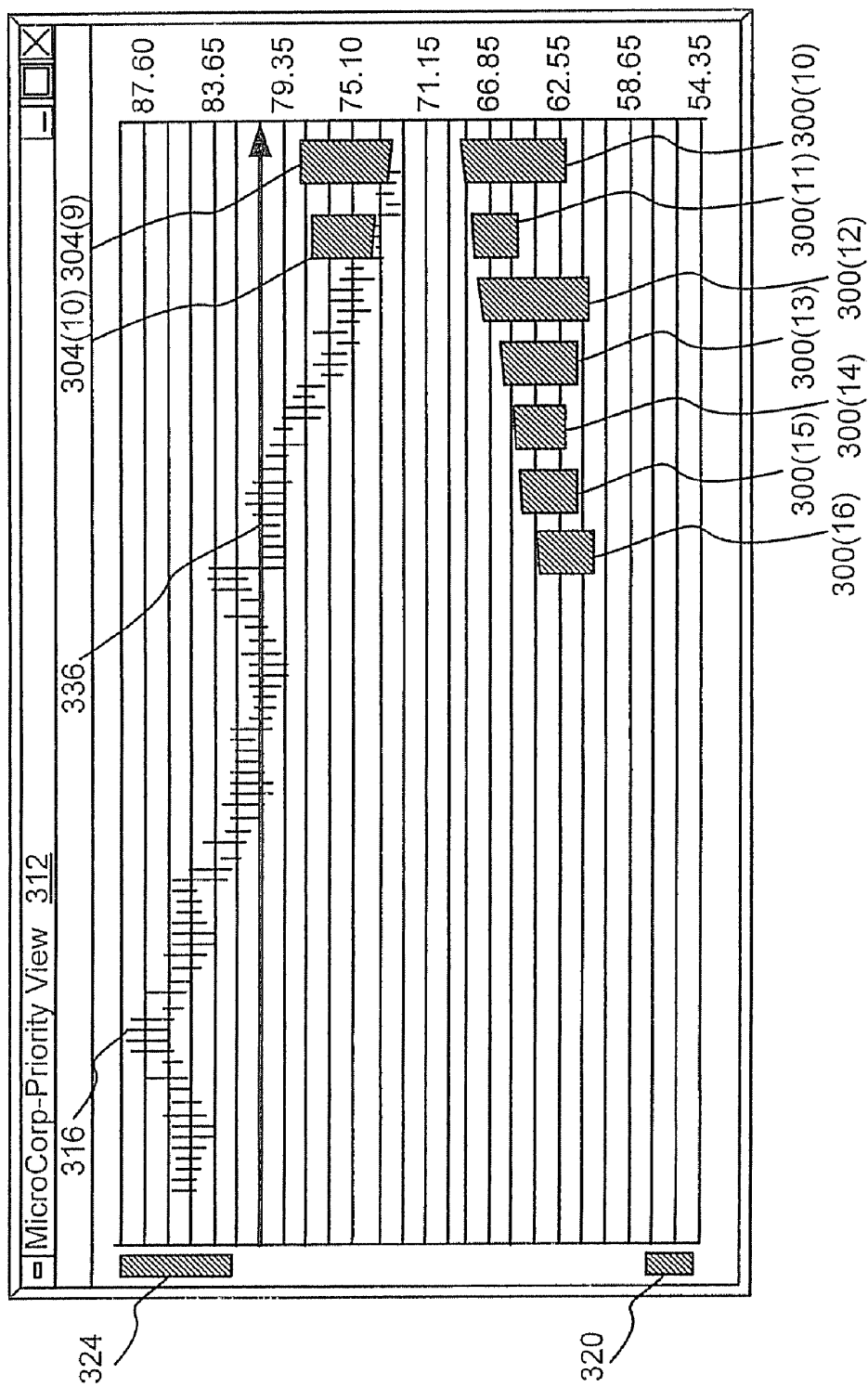


FIG. 3C

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BUY

Price:

Quantity:

Value: \$1436.00

Expires: ▼

FIG. 3D

SELL

Price:

Quantity:

Value: \$2505.00

Expires: ▼

FIG. 3E

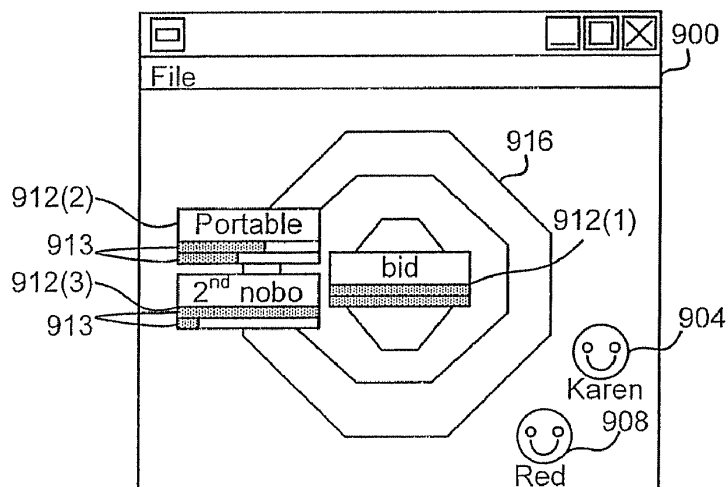


FIG. 9

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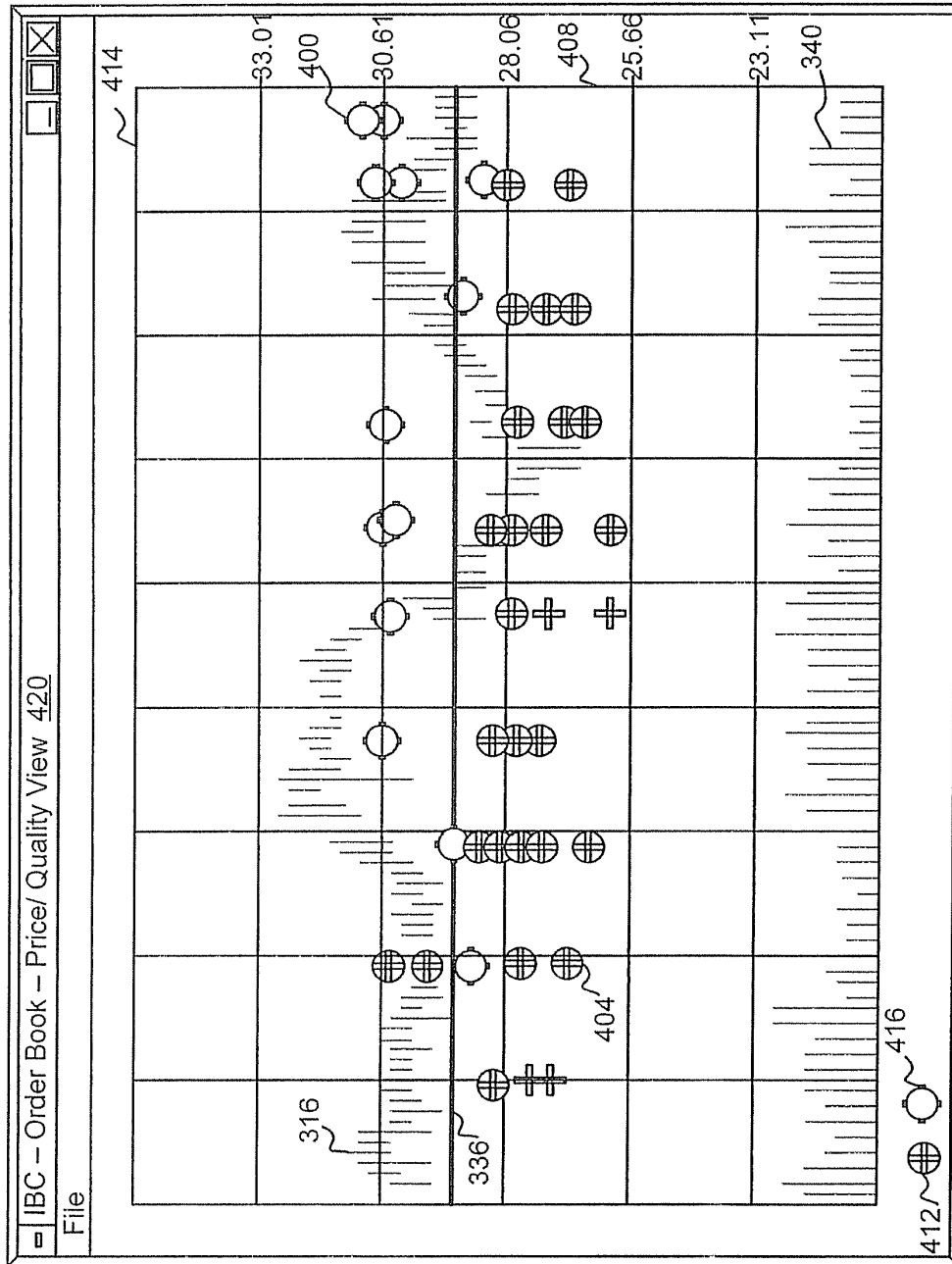


FIG. 4

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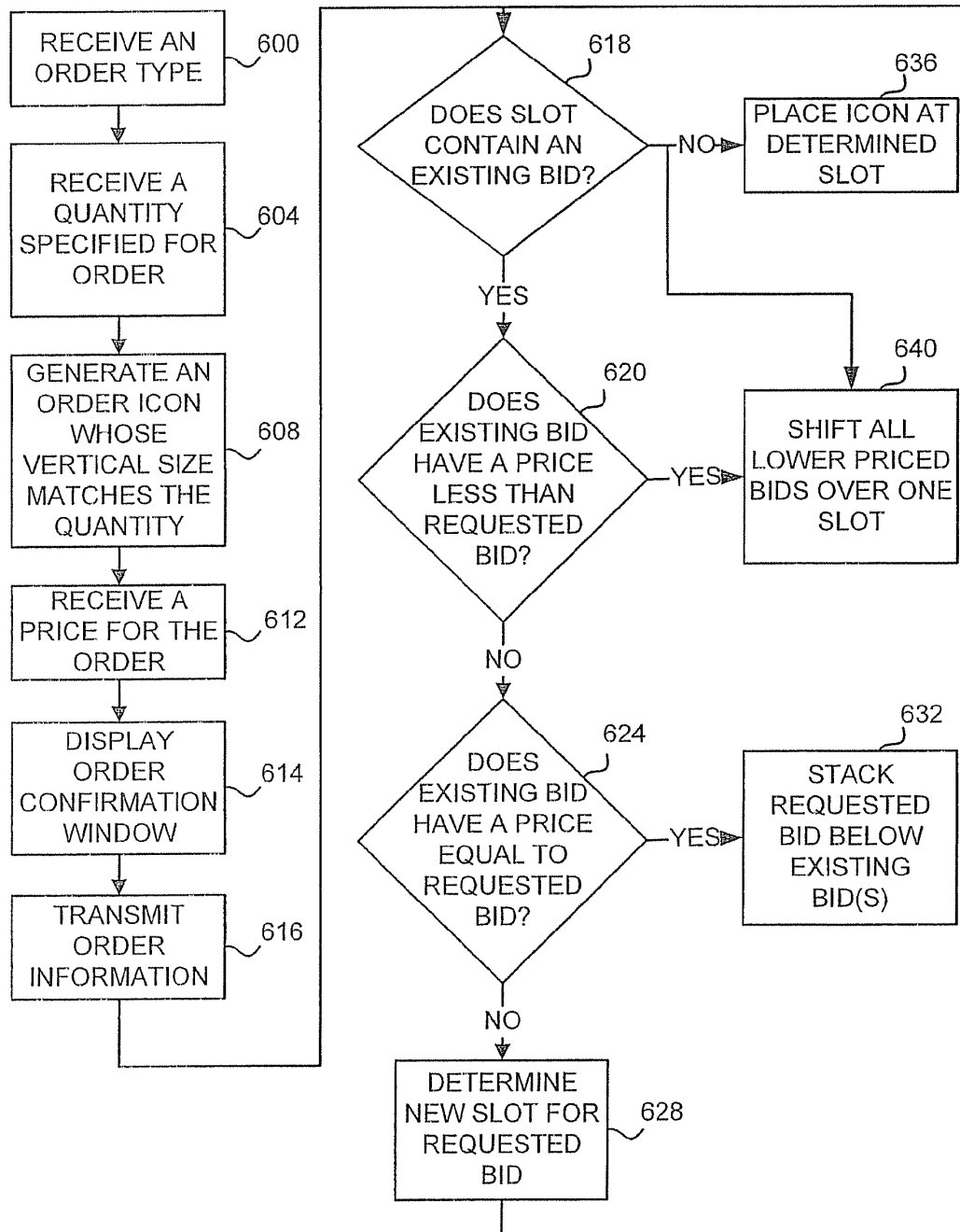


FIG. 6

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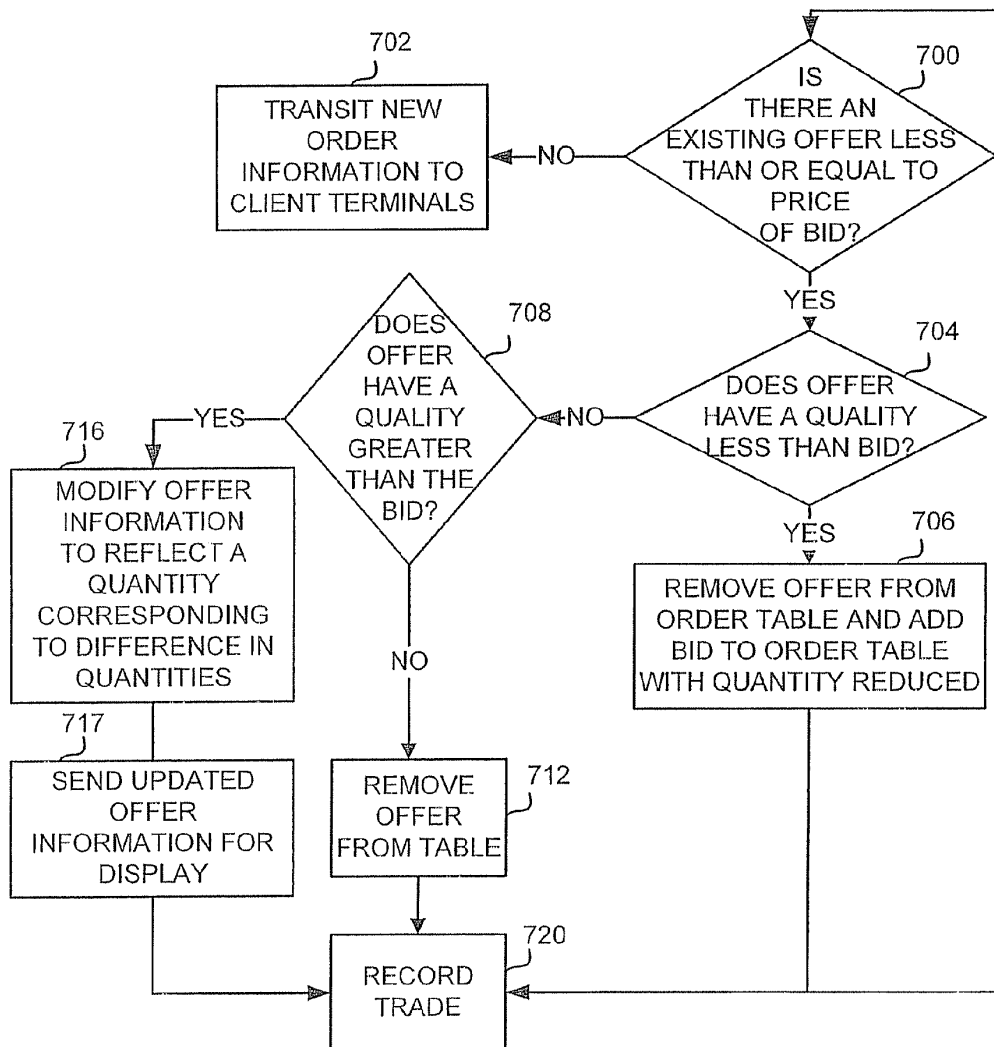


FIG. 7

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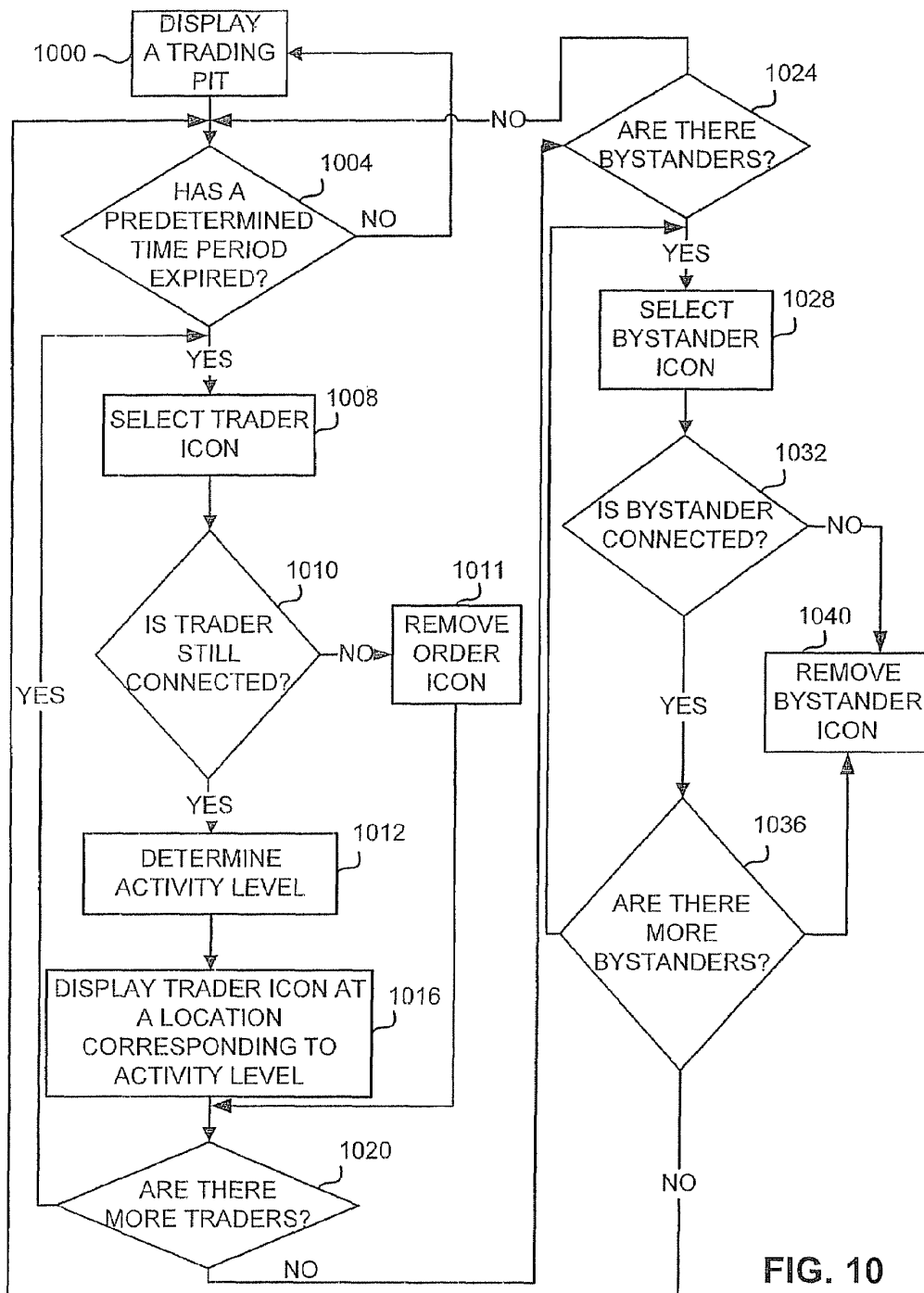


FIG. 10

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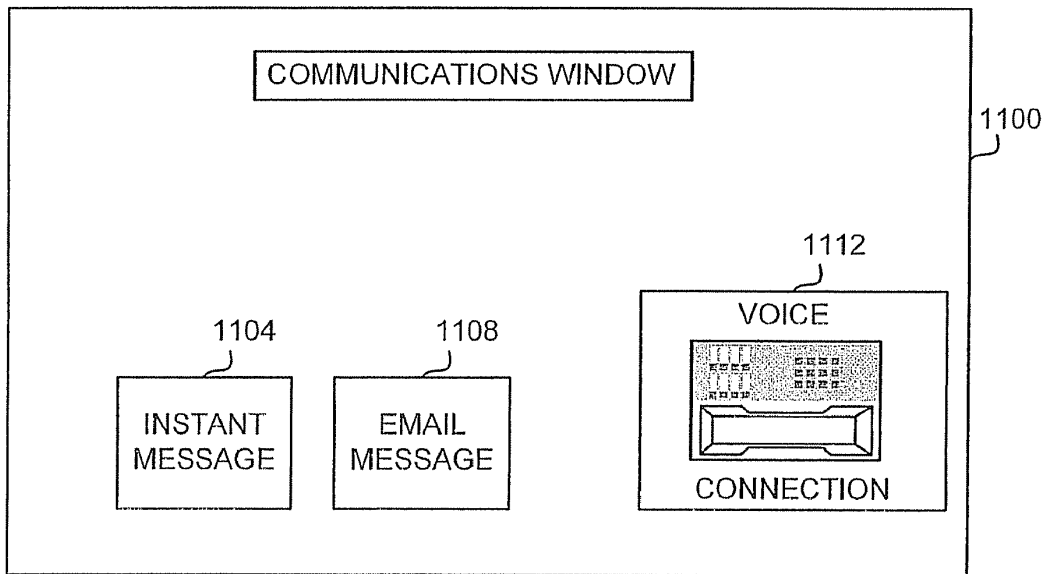


FIG. 11

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**USER INTERFACE FOR AN ELECTRONIC
TRADING SYSTEM****CROSS REFERENCE TO RELATED
APPLICATION**

This application is a continuation of U.S. patent application Ser. No. 09/289,550 filed Apr. 9, 1999 now U.S. Pat. No. 7,212,999, entitled "User Interface for an Electronic Trading System" the contents of which are fully incorporated herein by reference.

TECHNICAL FIELD

The present invention relates generally to the field of graphical user interfaces and more particularly to the field of graphical user interfaces for electronic trading systems.

BACKGROUND OF THE INVENTION

Trading pits are the lifeblood of a market economy. Quantities of goods and shares in companies are bought and sold by millions of investors through trading pits on exchanges everyday. When a particular trading product or item is more valued, the value of the item is driven up as a result of more aggressive bidding by the buyers. When an item is less valued, the value of the item is driven down as a result of more aggressive offers to sell the item. The successful trader anticipates the rise or fall of the value of an item and performs his or her own transaction before the rest of the market is aware of the item's potential gain or loss in value. Thus, anticipation of the market and specifically of the future demand for an item of interest is critical to the success of a trader.

The transactions for each item occur in a trading pit for that item. The trading pit is a designated area in an exchange in which the customers submit their orders, either bids or offers, for the item to a broker in the pit. The exchange records all transactions and relays or posts to the individual traders the outstanding bid having the highest value and the outstanding offer having the lowest value for the item, along with the quantity specified in the order. The exchange does not release information on all outstanding offers and bids to the traders because, in part, this information is what gives the market makers an advantage over the traders and enables the market makers to change their own trading directions quickly, step in front of customer orders, and use customer limit orders to protect the market makers from losses. However, for an individual trader, having only the latest order information for an item complicates the trader's task of ascertaining trends in the orders for an item because the trader has very little information about the volume of offers and bids or the rate at which these volumes are changing.

Other information is also used by the trader to anticipate the market, including current exchange performances, historical transaction data for the item, the number of traders at the pit, and the trader's sense of the activity of the pit. However, it is often difficult for a trader to quickly assemble this information from diverse and often unrelated sources or even effectively process all of this information in order to make an informed transaction decision. From this information, and other external information, the trader must attempt to determine trends in the buying or selling for the item in order to anticipate the market and the demand for a particular item.

Thus, a system is needed in which trend information of market demand for an individual item is provided to traders in an intuitive format which allows traders to quickly interpret how market demand is changing to an item. A system is also

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needed which provides contextual information about the item or the market to the trader while the trader is trading on a specific item in a manner which allows the trader to quickly interpret the information and then act accordingly.

SUMMARY OF INVENTION

The present invention is a user interface for an electronic trading system that allows a remote trader to view trends in the orders for an item, and provides the trading information in an easy to see and interpret graphical format. The user interface of the present invention operates in a system in which individual traders place orders including bids and offers, on remote client terminals, and this information is routed to a transaction server. The transaction server receives order information from the remote terminals, matches a bid for an item to an offer for an item responsive to the bid corresponding with the offer, and communicates outstanding bid and offer information back to the client terminals. Thus, in accordance with the present invention, each client terminal displays all of the outstanding bids and offers for an item, in contrast to the conventional systems and methods in which only the highest bid and lowest offer were known to the individual trader. This allows the trader to view trends in orders for an item, and thus better enables the trader to anticipate demand for the item.

For example, in one embodiment, a graph is formed with a value axis. Bid icons and offer icons for all outstanding bids and offers are displayed on the graph at locations corresponding to the values of the bids and offers. When an item is being "bid up," i.e., the demand for the item is growing, all of the new bids are displayed to the remote trader. The trader immediately sees the increasing demand for the item as it occurs, and thus may infer that the item may rise in value, and can enter an order to buy for the item immediately while the value for the item still appears low. In contrast, in conventional systems, the trader only knew of the existence of the highest bid, and therefore would not know that demand for the item was increasing. However, by "opening the book," all of the outstanding orders are displayed to all of the remote traders and each trader is able to immediately see the growing demand and maximize his or her position in the market accordingly.

The user interface of the present invention presents this information in an intuitive format, allowing the trader to make informed decisions quickly. In a priority view embodiment, bid and offer icons are displayed corresponding to an axis of values. This results in the bid icons being displayed on the lower portion of the screen and the offer icons being displayed on the upper portion of the screen. The trader is able to discern immediately the number and volume of bids and offers outstanding for the item and their difference in value. The bids and offers are preferably displayed in different colors, shapes, or other visual characteristics, further enhancing the trader's ability to quickly ascertain the current state of the market. The screen is updated frequently to display the most recent bids and offers. In one embodiment, the icons are formed having an edge which is angled toward the axis of values. When all outstanding offers and bids are displayed, the arrangement of icons naturally forms the edges of a triangle that points to the value differential at the axis of values. In yet another embodiment, the trader's own bids and offers are displayed in a first color or other visual characteristic, and the bids and offers of other traders are displayed in a second color or visual characteristic. This allows the trader to quickly determine his or her relative position in the marketplace. Finally, in a preferred embodiment, a size of the icons represents the quantity of the

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bid or offer, allowing an easy visual means of determining the relative quantities each bid and offer represent.

In a value/quantity view embodiment, an axis of values and an axis of quantities are used to determine the location of the bid and offer icons. The icons in this embodiment are markers or tokens and provide a different look and feel to the trader. Providing alternate views allow a trader to select a view with which the trader is most comfortable trading.

A value quantifying analytic is displayed in a further embodiment with respect to the value axis at a location corresponding to the current value which the analytic represents. The analytic is preferably displayed as a marker called an action line, in a color or other visual characteristic different from the other characteristics used to represent other objects being displayed. The action line is selected by each individual trader and can reflect value-to-earning ratio, volatility, volume of sales, or any other metric the trader designs, or can be selected from a listed of predetermined metrics. The action line responds to changes in the data it measures, updating in essentially real time.

The action line allows the trader to immediately determine the current valuation of the item relative to the trader's own valuation of the item. As the offers or bids approach the action line, the trader is prepared to complete a transaction in accordance with the trader's own valuation.

In another aspect of the invention, market data and other contextual data is displayed while the trader is viewing one of the aforementioned user interfaces. A historical chart is displayed in the background of a user interface to provide additional information to the trader who is determining the state of the market and how it may affect the value of the item. For example, the historical chart may represent the various market indices, historical values of the item or others, and any other historical value, quantity, or volume trend. The historical chart can represent the average value of the item over a period of time, or may represent a value or values for any other item or group of items. The historical chart is displayed with respect to a vertical axis of values, and is displayed horizontally responsive to time. The historical chart is updated to provide the latest information to the trader while the trader is trading. Thus, in accordance with the present invention, the trader is able to make instantaneous decisions regarding an item while receiving critical information about other items or the past performance of the current item and other indices. This is a major advantage over conventional methods of trading in which this information is not provided concurrently, and if presented at all, is difficult to process quickly.

An alternate embodiment provides a trading pit view that displays trader icons for each trader and positions the trader icons reflective of the activity level of the trader. Floor brokers and other bystanders are also displayed and identified to allow the trader to understand at a glance the respective positions and activity of all users currently connected to the transaction server for that trading pit. Selecting a trader icon provides information regarding the trader and can open up a window to allow the traders to communicate with each other using one or more methods including electronic mail, text chat or communication by voice over a network connection. The trading pit view allows the remote trader to immediately ascertain whom the trader is trading against, how active they are, and allows the trader to better anticipate the market.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a preferred embodiment of the electronic trading system of the present invention.

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FIG. 2 is a block diagram of a preferred embodiment of the transaction manager of the present invention.

FIGS. 3a-3c are screen shots illustrating an embodiment of a Priority View in accordance with the present invention.

FIG. 3d illustrates a buy order pop-up window.

FIG. 3e illustrates a sell order pop-up window.

FIG. 4 is a screen shot illustrating an embodiment of a Value/Quantity View in accordance with the present invention.

FIG. 5 is a flow chart illustrating a preferred embodiment of a method of displaying bid and offer icons in accordance with the present invention.

FIG. 6 is a flow chart illustrating a preferred embodiment of a method of generating a bid order icon in accordance with the present invention.

FIG. 7 is a flow chart illustrating a preferred embodiment of a method of generating an offer order icon in accordance with the present invention.

FIG. 8 is a flow chart illustrating an alternate embodiment of generating an order icon.

FIG. 9 is a screen shot illustrating a Pit Panel view in accordance with the present invention.

FIG. 10 is a flow chart illustrating a preferred embodiment of generating and placing a trader icon in accordance with the present invention.

FIG. 11 is a screen shot illustrating a communication window in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 illustrates the electronic trading system in accordance with the present invention. Client terminals 104 are coupled to a transaction manager 100. The client terminals 104 are personal computers, terminals as part of a network, or any other computing device. Traders use the client terminals 104 to interact with trading pits that are managed by the transaction manager 100. The transaction manager 100 manages transaction requests generated by the client terminals 104, routes information to, from, and between the terminals 104 and the transaction manager 100, and stores and retrieves information from a database 108 or databases 108.

FIG. 2 illustrates a more specific embodiment of the transaction manager 100. The clients 104 are coupled to log-in manager 204 to provide to each client access to the transaction manager 100, and to allow each client 104 to designate one or more trading pits 220 to which to be connected. The transaction manager 100 hosts one or more transaction servers 200. Each transaction server 200 is responsible for the trading of a specified item, essentially supporting a specific trading pit. The summary information agents 224 for each transaction server 200 provide a current status of the activity of each pit 220 to a trader connected to the log-in manager 204. The trader can select a pit 220 to which to be connected based upon the summary information. Once the log-in process is complete, the clients 104 are coupled to a registration server 212 for the specified trading pit 220. Registration for each pit 220 requires the client 104 to provide an access key that it received from the login manager 204 during log in.

After registering for a pit 220, the trader is able to add, modify or delete orders for the item being traded in the trading pit 220. One type of an order called a "bid" is an order to buy up to a specific quantity of an item at or below a specific value. Another type of an order called an "offer" is an order to sell up to a specific quantity of an item at or above a specific value. Other types of orders are possible depending on the type of item being traded in the trading pit 220.

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Each pit 220 includes a transaction server 200. The transaction server 200 receives orders, matches bids and offers (when a bid and offer are matched it is called a trade or execution) and routes information to both the database 208 and the client terminals 104 connected to the trading pit 220. The client terminals 104 generate icons for bid and offer orders (called bid and offer icons), historical charts and trader icons, and determine the placement of bid and offer icons and trader icons responsive to the information received from the transaction server 200. The database 208 to which the transaction server 200 is coupled stores the information corresponding to each trader, information on every order submitted over a period (such as start of trading days), information on every trade over a period (such as last 180 days) and the information corresponding to the item being traded. Each trader may have information associated with the trader's account stored, including a name, e-mail account, address, phone number, personal value quantifying metric or analytic activity level history, and various other information which is unique to the individual trader and which may be used by the present invention to create a virtual trading environment.

The information corresponding to every order includes whether the order was a new order, modifications to an existing order or deletion of a previously submitted order, the type of order (for example, bid or offer), the value, the quantity, the time and date the order was submitted, and any other information specific to the order. The information corresponding to every trade includes the value, quantity, buyer and seller. The information corresponding to the item being traded includes the highest outstanding bid value and the lowest outstanding offer value for the item, as well as a list of the values of all open orders for the item. The item information is stored on the database 208 in a data structure such as an order table. The server 200 updates the information in the order table responsive to receiving information from the client terminals 104. The updated information is then transmitted back to the client terminals 104. Other information, such as information used in creating historical charts, may also be stored on database 208. Information which may be global to more than one pit 220, for example, trader personal information, is also stored on the system database 108, to allow the information to be accessed by each trading pit 220.

For traders registered to the same trading pit 220, all of their orders (i.e. bids or offers specifying a value and quantity) are transmitted to the transaction server 200 for that pit 220. The server 200 analyzes the orders for matches with outstanding, or open, orders. If there is a match between orders of different types, for example, between a bid and an offer, then a transaction is enacted and the client terminals 104 are notified to remove the matched icons. All outstanding orders are transmitted to each client terminal, allowing a trader to view all of the outstanding orders from all traders for an item on a trading pit at any given time. The client displays are updated continuously or at specific intervals to provide updated information regarding which orders are outstanding and the state of the market in the pit 220. As shown in FIG. 2, multiple trading pits 220 are provided in the electronic trading system, and a single trader may be connected to as many pits 220 at the same time as desired. The number of trading pits 220 which may be maintained in accordance with the present invention is scalable responsive to the number of servers which are provided in the system. The items of trade include any possible commodity, for example, minerals, futures, or shares in a corporation. Other network configurations can be used to implement the electronic trading system as is known to those of ordinary skill in the art.

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The client terminals 104 provide the interactive link between the traders and the trading pits 220, and display the various user interfaces of the present invention. FIG. 3a illustrates a priority view 312 which is designed to allow traders to intuitively place orders 300, 304 and view markers 336 representing value quantifying metrics, and contextual trend data 316 in accordance with the present invention. In the priority view embodiment, orders 300, 304 are displayed at a location corresponding to their value with respect to the value axis 332. Values may represent price, interest rate, or any other metric by which an item may be valued. For example, offer 304(1) has a value of \$28.45, and the lowest point of the bottom edge 308 of the icon 304(1) is aligned with the value 28.45 on the value axis 332. In this embodiment, the top edges 309 of the bids and bottom edges 308 of the offer icons are angled. The rightmost bid is the bid having the highest value, and the rightmost offer is the offer having the lowest value. This allows the edges 308, 309 of the icons 300, 304 to form a triangle which points to the separation in value between the last lowest offer and the last highest bid. The quantity of each order is represented by a size of the icon such as its length or height. Icons having a larger size represent orders having a greater quantity. The specific quantity and other information of an order displayed on the screen may be known by selecting that order, which invokes a pop-up window to display the precise value and quantity of the selected order. In an alternate embodiment, the specific order information is displayed in the order task bar 328, in response to a trader selecting a bid or offer icon provided the order was submitted by the trader selecting the order. Alternatively, if space permits, the quantity and value may be displayed in the icon itself.

If there are several orders with equal value, the orders are stacked or placed adjacent to each other responsive to the time at which the order was placed. For example, bids 300(5), 300(6), 300(7) have equal values at \$29.50. Therefore, all three bid icons 300 are vertically stacked. A preferred method of stacking places the oldest orders closest to the horizontal space which naturally occurs and separates the bids and the offers. The horizontal separation between the bids and the offers occurs naturally because all of the bids displayed are always at a lower value than the displayed offers. If a bid is placed at a value equal to or exceeding an offer value, a transaction will be made immediately and the icons removed. For example, in the stack containing orders 300(7), 300(6), and 300(5) in FIG. 3a, the first and therefore the oldest bid in time was 300(7), and is placed at the top of the stack, closest to the horizontal separation between the displayed bids and offers. The other two stacked bids 300(6), 300(5) are positioned below the oldest bid 300(7), corresponding to the time at which they were submitted, and sorted in order of oldest to newest. In the stack containing offers 304(2), 304(3), and 304(4), the oldest offer 304(2) is positioned on the bottom of the stack closest to the horizontal separation, and the newest offer 304(4) is positioned on the top of the stack. The above method of ordering bids and offers is a preferred method, however other ordering schemes could be used within the scope of the present invention.

The trader using the client terminal 104 in accordance with the present invention, is shown all of the outstanding orders 300, 304 for the item being traded. This is one significant difference between the present invention and conventional systems because a trader using a system in accordance with the present invention is able to view trends in the bids and offers in addition to the buying and selling of the item being traded. For example, in FIG. 3A, a trader can quickly analyze the outstanding orders 300, 304, and determine that there are an almost equal number of bids 300(8) as offers 304(8). Thus,

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the trader may infer that the market is stable, and the value for the item will not be dramatically driven up or down in the near future. Accordingly, the trader may decide to take no action. However, as shown in FIG. 3b, if demand builds through an increased number of bids being made, as shown by the display of an increased number of bid icons 300, or bids are being made for large quantities, as shown by the display of bid icons 300 having a greater size, and if supply recedes as indicated by the display of a reduced number of offers icons 304, the trader can anticipate that the value for the item will increase. Consequently, the trader will place bids for the currently low valued offers 304. Thus, by viewing all outstanding offer icons 304 and bid icons 300 as they are made on an item, the trader can anticipate the market and quickly adjust his or her trading plans to take advantage of the information. In contrast, in conventional systems, the trader only knows the last highest bid and the last lowest offer. In the example of FIG. 3A, the trader would only know the existence of bid 300(1) and offer 304(1). Only the market maker would know of the existence of the other bids and offers. Individual traders would therefore be unaware of trends in bidding, and experience greater difficulty in anticipating the market.

The trader can also view the gap between offer icons 304 and bid icons 300 to determine at what value sales may be made and for what quantity. In the example of FIG. 3a, the trader can determine that there are several bids 300(5), 300(6), 300(7), at a value slightly less than \$27.35. Therefore, if the trader has a number of items to sell, the trader can make offers at that value and be assured of a sale of all of his or her items. However, if this value is too low, the trader can choose to keep all of his items until the value of the item has risen, which would be reflected in the display of additional bid icons at a higher value position in the screen. In contrast, if a trader was using a conventional system, the trader would have to offer his items incrementally, without knowing in advance when sales are likely to be made.

The value axis 332 indicates the value at which an item is being traded. This value may represent different qualitative measures for an item, such as the raw price for the item; for bonds, the value could be the cost for the bond or the implied interest rate for the bond, or the value be used as a measure for an implied volatility of the item, for example, a generic measurement of the relative expense of an option. Each trader can use their own value scale. For example, one trader may use a bond cost as an axis of values and another may use the implied interest rate of the bond. Regardless of a trader's choice of value, the different orders are displayed on the trader's screen in terms of the value the trader has chosen. Additionally, the value scales are completely customizable. For example, a gold arbitrageur could create a scale that measures the difference between the futures price of the metal less the spot cash price of the metal. The arbitrageur could then apply the cost of carry, including insurance and storage, to the future/cash price difference to generate an implied interest rate for the gold. Thus, the value axis for the arbitrageur would be an interest rate. In another example a trader who is interested in trading soybean oil could buy and sell soybeans, but, by using a value axis which accounts for the current cost of crushing soybeans, storage of soybeans, transport, etc, can be actually trading in soybean oil. Thus different traders in the same trading pit 220 would see the same bid and offers but organized with respect to their own specific value axis. Thus, the present invention provides enormous flexibility in constructing a view of an item's value which is directly representative of the trader's own interest in the item.

The priority view 312 offers several other advantages to a trader. The offers 304 and the bids 300 are displayed in

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different colors, shapes, textures or sizes, or other distinguishing visual characteristics, to allow the trader to quickly ascertain the current state of the market for this item. Additionally, orders made by the trader are displayed having a different visual characteristic than the visual characteristic used to display orders of other traders. This allows the trader to easily distinguish between their own orders and the orders of other traders. For example, in FIG. 3a, the trader is able to immediately determine that offers 304(3) and 304(7) are the trader's own offers 304, and therefore should be discounted from any market analysis. In FIG. 3a, the trader can also quickly determine that the trader himself is the trader with the most bids 300 in place, which suggests to the trader that the value for the item may be driven down if the trader removes his bids 300 from the pit 220.

Orders can be placed by a trader using the user interface of the present invention in variety of ways. In one embodiment, as shown in FIG. 3a, the trader can directly submit an order by using the order task bar 328. The options to specify value and quantity of either a bid or offer, and the expiration period are provided. After the information is entered, the trader selects Place Order, and the order is submitted to the transaction server 200 for the pit 220, and an offer or bid icon 304, 300 is generated and displayed at the desired location at the desired size. The order information is communicated to the transaction server 200 and from there to the other client terminals, so that the new bid/offer appears in the displays of all other traders in this same pit. In a preferred embodiment, the trader submits an order by simply selecting either an offer token 324 or bid token 320 using a pointing device. After being selected, the trader adjusts the size of the offer or bid token 324, 320 until the size of the token matches the desired quantity of the order. Preferably, a pop-up window or other screen indicator is displayed to show in numerical terms the quantity of the current size of the token, to ease the process of creating a properly sized order token. Next, the token is dragged to a location on the screen which corresponds to the desired value of the order. Again, a screen indicator displays the current value for the token at its current location as it is being dragged to allow precise placement of the token at the desired value.

In the embodiment of FIG. 3a, a value marker 344 follows bid token 320 as it is moved to a location in the display. The value marker 344 indicates the value of the new order as the order is being placed. This allows for the trader to easily and precisely move the token 320, 324 to the desired value. After reaching the desired value, the trader releases the pointing device button and a Buy pop-up window 350, as shown in FIG. 3d, is displayed with the bid order information. The Buy pop-up window 350 allows the trader to modify the order information (value, quantity, expiration), cancel the order or submit the order with the presently displayed information. If the order is to sell an item, a Sell pop-up window 354 is displayed, as shown in FIG. 3e. After the order is submitted to the transaction server, it will be displayed on the screens of all traders in this trading pit connected to the transaction server 200.

An additional feature of the user interface of the present invention is the provision of contextual data. Contextual data comprises historical trading data of the item, historical or current trading data of other items, historical or current trading data of an average of items. For example, the trader may wish to have the Dow Jones Average™ displayed on the screen, and updated in realtime. Viewing contextual data along with the outstanding offers and bids allows the trader to better anticipate the market. For example, if the Dow Jones™ average is used as the contextual data, and is falling sharply, the trader may decide to begin selling his items even though

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the value of the item in the pit **220** has been stable. This allows the trader to anticipate where the market is headed. Any type of data useful to the trader can be displayed as contextual data. The contextual data **316** is preferably displayed as a historical chart **316** along a vertical axis of values and against a horizontal axis of time. The historical chart **316** can be displayed against any time period, for example, hours, minutes, etc. The historical chart **316** is updated periodically as the data for the item is updated. If the historical chart **316** includes the current item, as shown in FIG. 3a, bar lines are displayed in the data to indicate the high and low values of the item for that time period. A volume graph **340** is displayed at the bottom edge of graph. The volume graph illustrates the volume of transactions in the pit **220**, and gives additional information to the trader regarding the state of the market for the item.

Yet another feature of the user interface of the present invention is the display of a marker **336**. The marker **336** is representative of a value quantifying metric specified by the trader. The metric determines a current action value for the item which identifies the value at which the trader should act if the value of the item rises above the action value or falls beneath the action value. For example, in FIG. 3b, the value quantifying metric generates an action value of \$68.57. The marker **336** is displayed at this value to indicate to the trader the location of the action value in relation to the current bids **300** and offers **304**. In the example of FIG. 3b, the marker is displayed as an action line **336**. As can be seen, the outstanding bids are below the action line **336** and the current offers are above the action line **336**. This indicates to the trader that no action should be taken.

The value quantifying metric can be an algorithm or formula based upon factors the trader believes are important in ascertaining the true worth of an item. This metric can be set to reflect value-to-earnings ratio, volatility, volume of orders, percent gain, or any simple or complex design. The trader can input a custom metric or can select a metric from a pre-designated list of metrics. Metrics may also be purchased from 3rd parties and incorporated into the client terminal **104**. This allows new metrics to be added at any time. The action value displayed by metrics are dynamically determined either by the client terminal **104** or the server **200**, and updated whenever new data is received regarding a component of the metric. Thus, the trader is given the latest information to update the trader's action line **336**, allowing the trader to make current, informed decisions regarding possible orders. For example, in FIG. 3c, the metric has been updated from the time of FIG. 3b. The action line **336** has moved corresponding to the new action value of \$80.21. As can be seen, displaying the updated action line **336** allows the trader to immediately determine that the outstanding offers are now below his action line **336**, and therefore that these offers should be purchased despite the fact that the offers themselves remained at the same value from the time of FIG. 3b to the time of FIG. 3c.

As discussed above, a trader may be connected to several trading pits **220** at once. If a trader has multiple connections, the trader can view the different pits **220** simultaneously, or if the trader wishes to concentrate on a single item, the trader can have only one pit **220** displayed. Additionally, the trader can disable the different options for a view to suit the trader's preferences, and maximize visibility for a trader's particular terminal **104**.

FIG. 4 illustrates an alternate view of the user interface in accordance with the present invention. The value/quantity view **420** illustrates the market for the item using a first axis of values **408** and a second axis **412** for quantity. Thus, the location of each offer icon **400** and each bid icon **404** represents the value for the offer or bid and the quantity for which

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the offer or bid is made. Optionally, the action line **336** is also displayed, as well as the contextual data. The alternate view provides a different intuitive perspective on the state of the market. By providing alternate views, as shown in FIG. 3C, the electronic trading system of the present invention allows the different preferences of different traders to be met. Orders in this view are placed by selecting an offer token **416** or a bid token **417** and moving the token to a location which corresponds to the desired quantity and value. If the trader wishes to purchase immediately, the trader can simply drag a bid token **417** to the location directly over any offer token, and a window pops up displaying a bid order with value and quantity equal to that of the offer token. If the trader wishes to sell immediately, the trader can simply drag an offer token **416** to the location directly over any bid token, and a window pops up displaying an offer order with value and quantity equal to that of the bid token. The trader can then execute the transaction.

FIG. 5 is a flow chart illustrating a preferred embodiment of the user interface in accordance with the present invention. The client terminal **104**, through data received from the transaction server **200**, displays **500** at least one outstanding bid icon corresponding to a quantity and value of the bid. The client terminal **104** also displays **504** at least one outstanding offer icon corresponding to a quantity and value of an offer. Thus, by displaying at least one outstanding bid and offer icon, the "book" is opened and traders viewing the client terminal can readily spot trends in supply and demand for an item and quickly anticipate the market.

FIG. 6 illustrates an embodiment of a method of generating an order icon in accordance with the priority view **312** of the present invention. First, the client terminal **104** receives **600** the order type. The order can be either a bid or an offer. The trader specifies the type by selecting an offer or bid token to place the order, or by manually indicating the order type on the task bar. Second, the client terminal **104** receives **604** a quantity specified for the order. The quantity, as described above, is specified by the trader either by entering the number directly into the order task bar or by adjusting the size of the order token. In an embodiment where the order information is entered into the taskbar, an order icon will be generated **608** whose vertical size matches the quantity specified after the order has been processed by the server **200**. The client terminal **104** then receives **612** a value for the order. Again, the trader can specify the value by entering the information into the taskbar or can drag the order token to the location corresponding to the value. Finally, the client terminal **104** displays **614** an order confirmation window displaying the value, quantity, and expiration information. The trader can modify the order in this window and then must either cancel the order by closing the window or pressing the cancel button or submit it by pressing the OK button. The client terminal **104** which receives the value and quantity and order type information transmits **616** the information to the server **200**. The server **200** then processes the order information, and updates the order table.

Once the server **200** transmits updated order information to a client terminal **104**, the client terminal **104**, in the priority view, determines **618** whether a slot is open adjacent an existing order which has a lower value, if the order is a bid, or a higher value, if the order is an offer. In the priority view **312**, the horizontal axis is divided into slots, each slot having a width equal to an order icon **300**, **304** and each slot separated by a standard set-off unit. Incoming orders are sorted by the value of the order. For offers, the offers with the lowest values are positioned closest to the axis of values **332**, and for bids, the bids with the highest values are positioned closest to the

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axis of values 332. When a new order is received, the client terminal 104 re-sorts the outstanding orders and places the order icons 300, 304 in the appropriate positions. If a new order is equal to an existing order of the same type, the order is stacked onto the existing order. FIG. 6 illustrates a more detailed methodology of the sorting mechanism, using the example of placing a new bid. However, the methodology is equally applicable to placing a new offer.

A new bid is designated for the slot adjacent an existing bid which has the least value of the set of existing bids having values greater than the value of the new bid. The client terminal 104 determines 618 whether this determined slot has an existing bid within it. If it does not, the icon is placed 636 at the determined slot. If the slot does contain an existing bid, the client terminal 104 determines 620 whether the existing bid has a value less than the requested bid. All existing bids that have values less than the requested bid are moved 640 to the adjacent slot positioned away from the axis of values 332. In the example of FIG. 3a, the adjacent slot would be a slot positioned to the left. All other bids having values less than the requested bid are shifted 640 correspondingly. If the client terminal determines 624 that the existing bid has a value equal to the existing bid, the requested bid is stacked 632 below the existing bid or bids, away from the horizontal separation between bids and offers as described above. If the client terminal 104 determines 628 that the existing bid is greater than the requested bid, a new slot is determined 628 for the requested bid, and the process is repeated.

As shown in FIG. 7, upon receiving new bid information, the transaction server 200 determines 700 whether there is an existing offer in the order table having a value less than or equal to the requested bid. If there is not, the new bid is added to the table, and the information regarding the new bid is sent 702 to the client terminals 104 for display. If there is an existing offer whose value is less than or equal to the requested bid, i.e., if the new bid is the highest value bid outstanding, the server 200 determines 704 whether the existing offer has a quantity which is less than the quantity represented by the bid. If the offer does have a quantity less than the bid, the server removes 706 the offer from the order table and adds a new bid to the order table with the quantity reduced by the quantity of the offer removed.

The server 200 records 720 a trade between the trader submitting the new bid and the trader submitting the removed offer, at a value equal to the offer value and a quantity equal to the offer quantity. All of the outstanding client terminals 104 are sent the information regarding the trade. The client terminals 104 then remove the existing offer icon and add a bid icon which has a size corresponding to the difference in quantities between the existing offer icon and the requested bid icon. The transaction server 200 determines 700 again whether there is another existing offer in the order table having a value less than or equal to the requested bid to determine if another transaction can be made with the quantity remaining in the bid.

The server 200 also determines 708 whether the offer has a quantity greater than the quantity of the requested bid. If it does, the quantity of the offer is reduced 716 by the quantity of the bid, and the updated offer information is sent 717 to the client terminals 104 for display. A trade is recorded 720 between the trader submitting the new bid and the trader who submitted the offer at a value equal to the offer value and a quantity equal to the bid quantity. All of the outstanding client terminals 104 are sent the information regarding the trade and update the user interface displays accordingly.

If the quantities of the bid and offer are equal, the offer is removed 712 from the table and the transaction is complete. A

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trade is recorded 720 between the trader submitting the new bid and the trader who submitted the offer at a value equal to the offer value and a quantity equal to the bid quantity. All of the outstanding client terminals 104 are sent the information regarding the trade, and update the user interface displays accordingly.

As shown in FIG. 8, in the value/quantity view, the client terminal 104 receives 800 a value, receives 804 a quantity, and receives 806 an order type for a new order. A confirmation window is displayed 807, and, upon confirmation of the order, the order information is transmitted to the server 200. Again, this may occur responsive to the trader entering in the information directly or dragging an order token to the proper location and after confirming the order. The server 200 receives the order information, updates the order table, and sends the updated information to the client terminals 104. The client terminals 104 display a new order icon at a location corresponding to the value and quantity of the order with respect to the axis of quantities and axis of values. If the new order is an offer, and there is an existing bid for a value higher than or equal to the value of the offer, a transaction is completed, and a new offer or a modified bid token is displayed responsive to the quantities that the original offer and bid icons represented.

FIG. 9 illustrates a trading pit view 900 called the pit panel view 900, in accordance with the present invention. The pit panel view 900 provides a visual interface to other members of the pit 220. All users who are currently registered to the pit 220 are displayed in the pit panel 900. This is critical information to a trader regarding the activity of the pit 220. If the pit 220 is crowded, the trader can expect volatility in trading. If the pit 220 is empty, the trader can expect light trading and relatively stable values for the item.

The pit panel 900 displays trader icons 912, observer icons 904, and floor broker icons 908. Observers are users who are registered to the pit 220 but who are not actively trading and floor brokers are individuals who have expertise on a pit's item and traders, and who assist traders in executing unusual trades, negotiating a deal with multiple traders, or providing history and information on traders to others. As the observers do not trade for themselves, their icons 904 are placed on the outside of the pit icon 916. Floor brokers who do not trade also have their icons 908 placed on the outside of the pit icon 916.

The trader icons 912 are displayed on the pit icon 916. The pit icon 916 is preferably displayed as a series of concentric polygons, where each polygon represents an activity level or levels. Traders who are more active are placed closer to the center of the pit icon 916. The most active trader, in the example of FIG. 9, trader 912(1), is placed in the center of the pit icon 916. In a preferred embodiment, each polygon represents a range of activity levels. For example, the innermost polygon contains the traders with the second through ninth highest activity levels. The next polygon contains the traders having the tenth through twenty-sixth highest activity levels, and so forth. By grouping traders into activity ranges, and thus shifting a trader's icon out of a polygon only in response to the trader's activity level shifting out of the range represented by the polygon, icon changes and consequent flicker in the display of the pit icon 916 are minimized. However, a trader is able to easily ascertain who the active traders in a pit 220 are and how active the traders are by noting the relative locations of the trader icons 912 in the pit icon 916.

Each trader icon 912 has order indicators 913 to show the quantity of orders a trader has outstanding. Preferably, there are separate indicators 913 for bids and offers, each showing the volume of outstanding bids or offers the trader currently

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has placed. Other order indicators **913** may be optionally displayed, for example, indicating the sum of all quantities of orders or the volume of orders entered over a specified period of time. Selecting a trader's icon **912** will also highlight the trader's orders on the priority view, value/quantity view, and other views provided in the system that display orders and which can all be displayed concurrently. Double clicking on a trader icon **912** generates a communication window as shown in FIG. **11** which allows the trader to send an email message **1108**, send an instant message **1104** as part of a text chat session, communicate by voice over the network connection **1112**, or set up a later telephone call or other optional communication to the selected other trader. Thus, the pit panel **900** provides a sense of community in the pit **220** by visual representing useful information, and provides additional information to the trader which the trader can use in anticipating the market.

FIG. **10** is a flow chart illustrating a preferred embodiment of generating and placing a trader icon in accordance with the present invention. First, a trading pit icon **916** is displayed **1000**. Next, the client **104** determines **1004** whether a predetermined period of time has passed. The pit panel data is updated periodically, and the client **104** waits for that amount of time before re-generating the display with the new data. If the server **200** determines **1004** that the predetermined period has expired, a first trader icon is selected **1008**. The client **104** determines **1010** whether the trader is still connected to the server **200** from the data provided by the server **200**. If the trader is not, the trader icon **912** for the trader is removed **1011**, and the client **104** determines **1020** whether there are more traders. If the trader is still connected, an activity level is determined **1012** for the trader. Activity levels are determined as a combination of the volume of outstanding orders, the value of outstanding orders, recent activity, or other measures which determine how active a trader has been. Once the activity level has been determined, the client **104** displays **1016** the icon **912** for the trader at the location corresponding to the activity level. In an embodiment where order indicators **913** are displayed, the order indicators **913** are updated to include the latest order data. In the preferred embodiment, as discussed above, the pit icon **916** is comprised of concentric polygons or rings, the traders are ordered by activity levels, and each polygon represents a range of activity level orders. After the activity level of a trader is determined, the traders are reordered responsive to their activity levels, and the trader icon **912** for each the trader is placed in the polygon designated for the order of the trader. The client **104** determines **1020** if there are more traders. If there are not, the client **104** determines **1024** if there are bystanders and, if there are, selects **1028** the first bystander icon **904**, **908** and determines **1032** whether the bystander is connected using data that is provided by the server **200**. If the bystander is not connected, the bystander icon is removed **1040**. If the bystander is connected, the client **104** determines **1036** whether there are more bystanders. If there are not, the client **104** returns to the step of determining **1004** whether a predetermined time period has ended, as the pit panel **900** view has been updated to reflect the current users and their current activity levels.

We claim:

1. A method of operation used by a computer for displaying transactional information and facilitating trading in a system where orders comprise a bid type or an offer type, the method comprising:

receiving bid and offer information for a product from an electronic exchange, the bid and offer information indicating a plurality of bid orders and a plurality of offer orders for the product;

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displaying a plurality of bid indicators representing quantity associated with the plurality of bid orders, the plurality of bid indicators being displayed at locations corresponding to prices of the plurality of bid orders along a price axis;

displaying a plurality of offer indicators representing quantity associated with the plurality of offer orders, the plurality of offer indicators being displayed at locations corresponding to prices of the plurality of offer orders along the price axis;

receiving a user input indicating a default quantity to be used to determine a quantity for each of a plurality of orders to be placed by the user at one or more price levels;

receiving a user input indicating a desired price for an order to be placed by the user, the desired price being specified by selection of one of a plurality of locations corresponding to price levels along the price axis; and

sending the order for the default quantity at the desired price to the electronic exchange.

2. The method of claim 1, further comprising:

receiving a user input indicating a second desired price for a second order to be placed by the user, the second desired price being specified by selection of one of the plurality of locations corresponding to price levels along the price axis; and

sending the second order for the default quantity at the second desired price to the electronic exchange.

3. The method of claim 1, further comprising:

receiving a user input indicating a new default quantity, wherein the new default quantity is used to determine a quantity for each of a plurality of orders to be placed by the user at one or more price levels.

4. The method of claim 3, further comprising:

sending the order for the new default quantity at the desired price to the electronic exchange.

5. The method of claim 1, further comprising:

displaying an order icon at a location that corresponds to the desired price level along the price axis, the order icon indicating the user's order at the electronic exchange.

6. The method of claim 5, further comprising:

displaying the plurality of bid indicators using a first visual characteristic;

displaying the plurality of offer indicators using a second visual characteristic; and

displaying the order icon using a third visual characteristic.

7. The method of claim 5, wherein the order icon indicates the default quantity working at the electronic exchange.

8. The method of claim 1, wherein a size of each bid indicator of the plurality of bid indicators is determined based on the quantity associated with that bid indicator, and wherein a size of each offer indicator of the plurality of offer indicators is determined based on the quantity associated with that offer indicator.

9. The method of claim 1, wherein each bid indicator of the plurality of bid indicators displays quantity associated with a price level, wherein each offer indicator of the plurality of offer indicators displays quantity associated with a price level along the price axis.

10. The method of claim 1, wherein selecting one of the plurality of locations corresponding to price levels along the price axis comprises releasing a pointing device over one of the plurality of locations.

11. The method of claim 1, further comprising:

upon receiving the user input indicating the desired price for the order, automatically displaying a pop-up window with the default quantity and the desired price.

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12. The method of claim **11**, wherein the pop-up window allows the order to be sent to the electronic exchange.

13. The method of claim **1**, wherein the default quantity is a default quantity for orders of a bid type.

14. The method of claim **1**, wherein the default quantity is a default quantity for orders of an offer type.

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15. The method of claim **1**, further comprising:
adjusting a size of an order token to indicate the default quantity.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,533,056 B2
APPLICATION NO. : 11/417544
DATED : May 12, 2009
INVENTOR(S) : Richard W. Friesen et al.

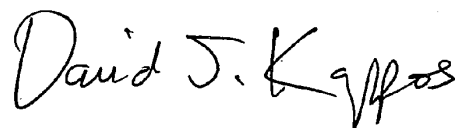
Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 14, line 9: please delete "plurality offer orders" and insert -- plurality of offer orders --.

Signed and Sealed this

Ninth Day of February, 2010

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style.

David J. Kappos
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,533,056 B2
APPLICATION NO. : 11/417544
DATED : May 12, 2009
INVENTOR(S) : Richard W. Friesen et al.

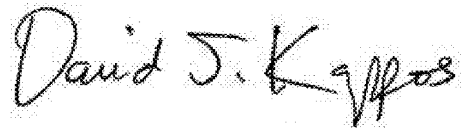
Page 1 of 9

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Delete drawing sheet, consisting of figs. 2, 3A, 3B, 3D, 3E, 9, 4, 6, 7 and 10 substitute therefor the drawing sheets, consisting of figs. 2, 3A, 3B, 3D, 3E, 9, 4, 6, 7 and 10 as shown on the attached pages.

Column 6, line 35: please delete "\$29.50" and insert --slightly less than \$27.35--.

Signed and Sealed this
Twenty-second Day of March, 2011

A handwritten signature in black ink, reading "David J. Kappos". The signature is written in a cursive, flowing style with a large initial "D".

David J. Kappos
Director of the United States Patent and Trademark Office

CERTIFICATE OF CORRECTION (continued)

Page 2 of 9

U.S. Patent

May 12, 2009

Sheet 2 of 11

7,533,056 B2

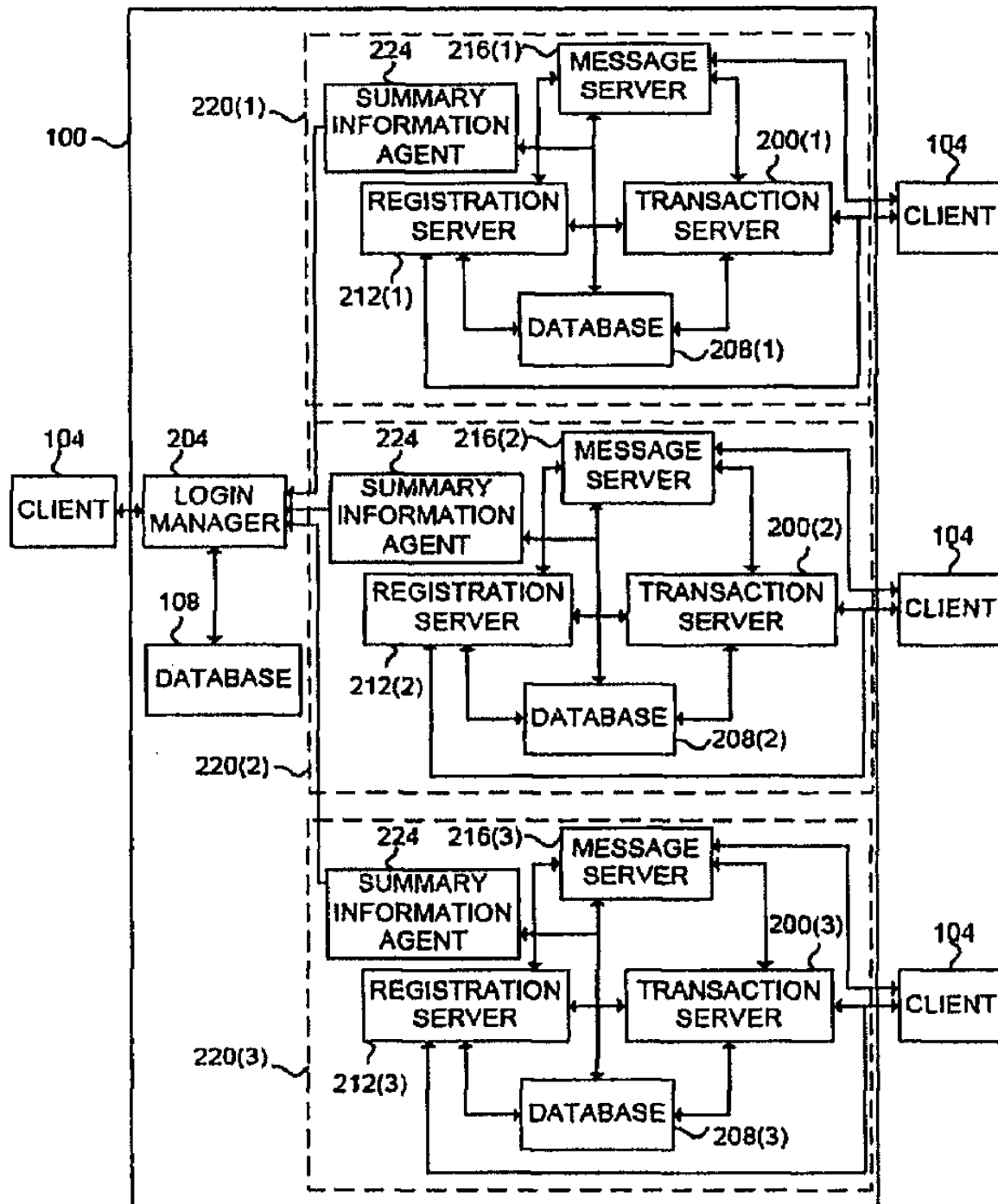
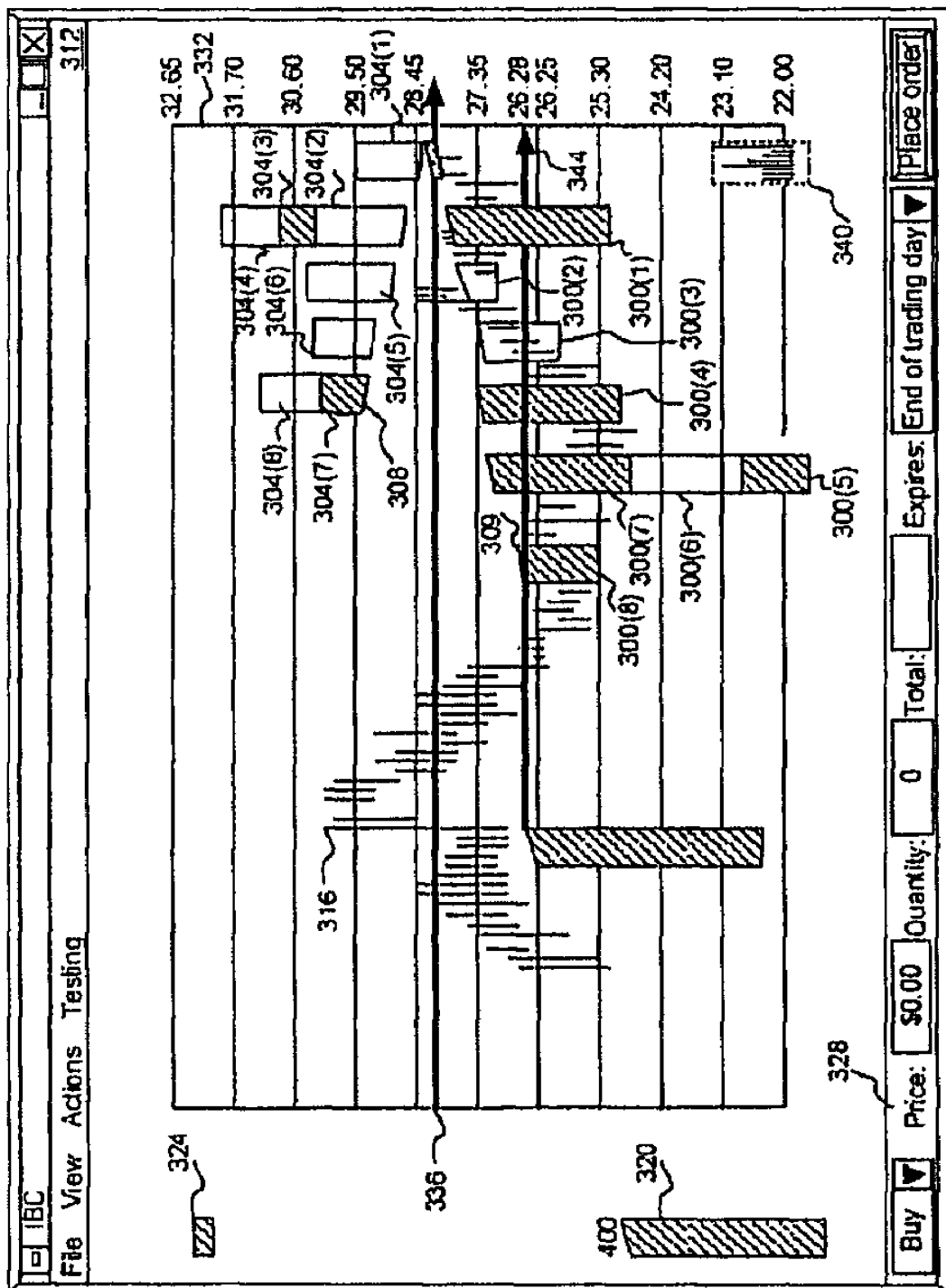


FIG. 2



CERTIFICATE OF CORRECTION (continued)

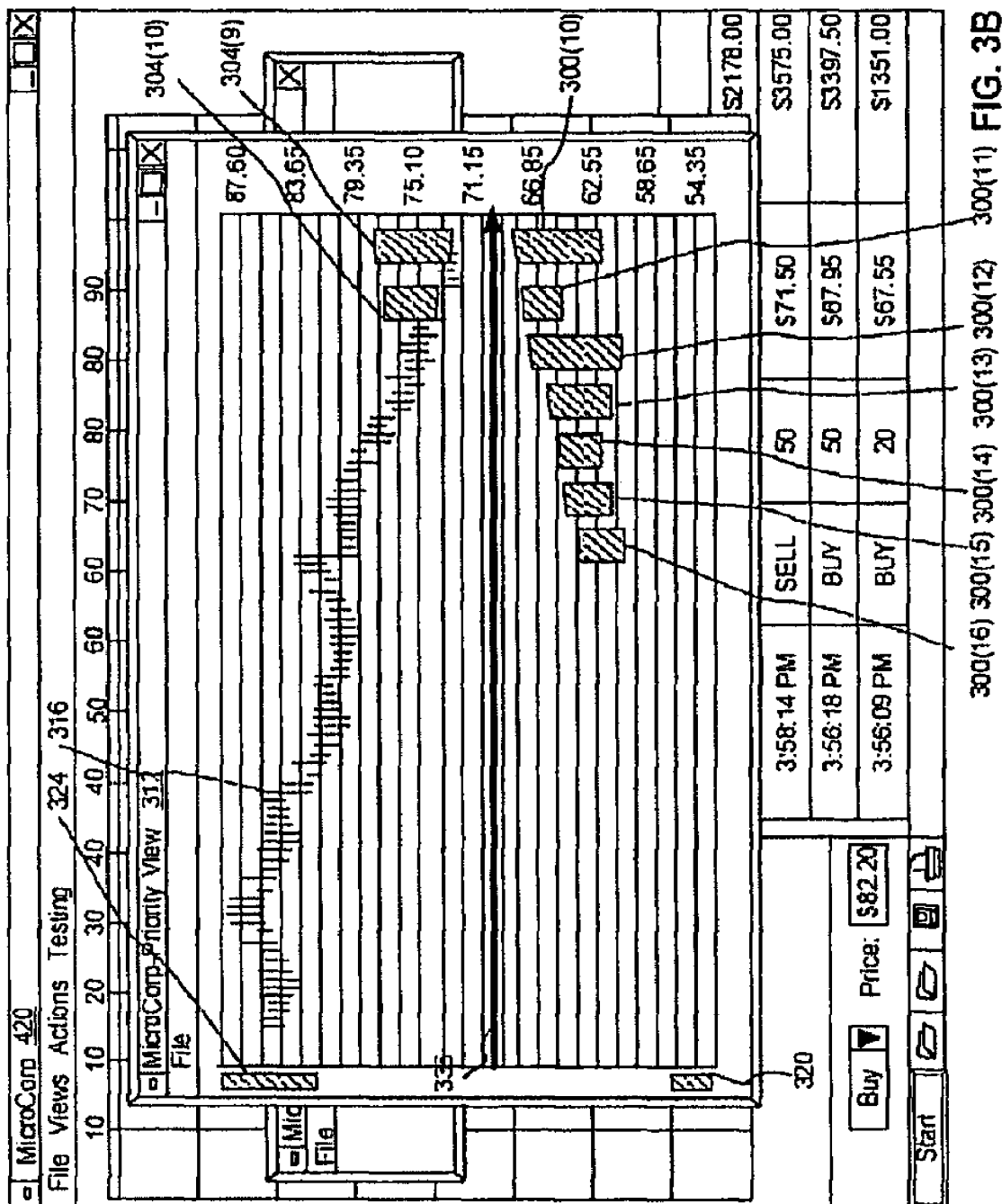
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7,533,056 B2



CERTIFICATE OF CORRECTION (continued)

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BUY

Price:

Quantity:

Value: \$1436.00

Expires: ▼

FIG. 3D

SELL

Price:

Quantity:

Value: \$2505.00

Expires: ▼

FIG. 3E

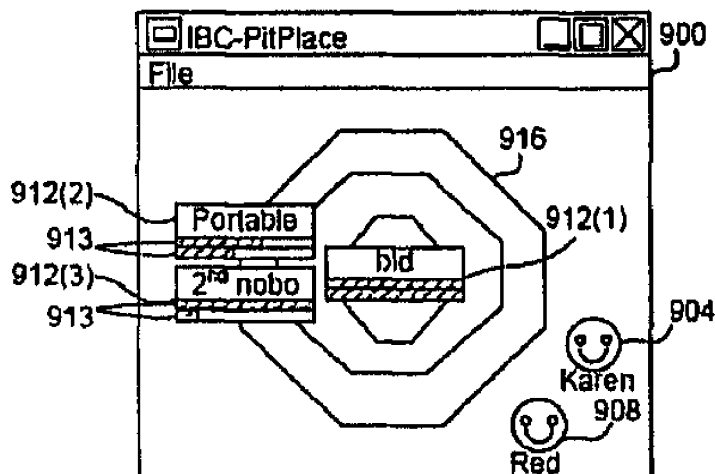


FIG. 9

CERTIFICATE OF CORRECTION (continued)

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7,533,056 B2

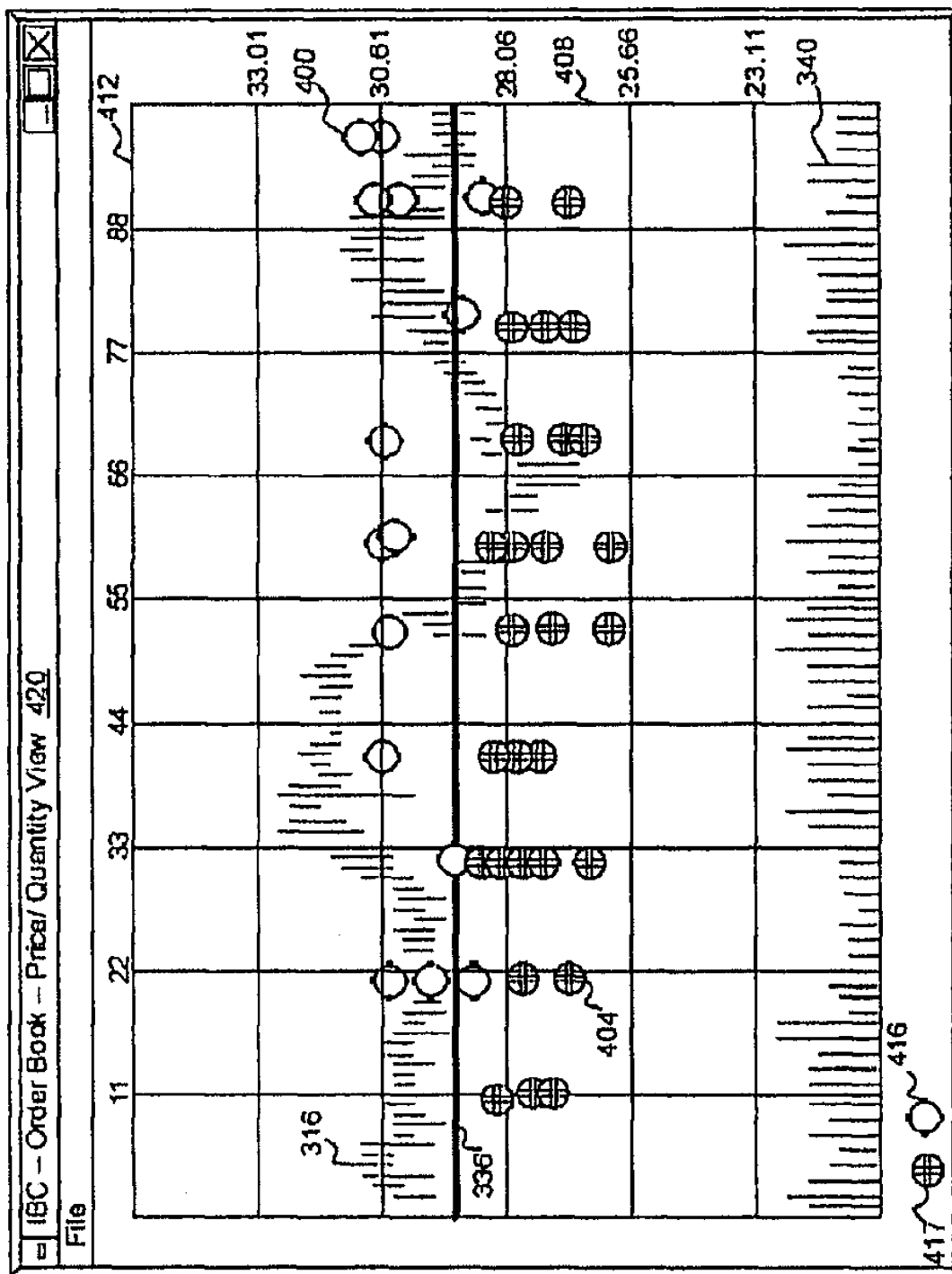


FIG. 4

CERTIFICATE OF CORRECTION (continued)

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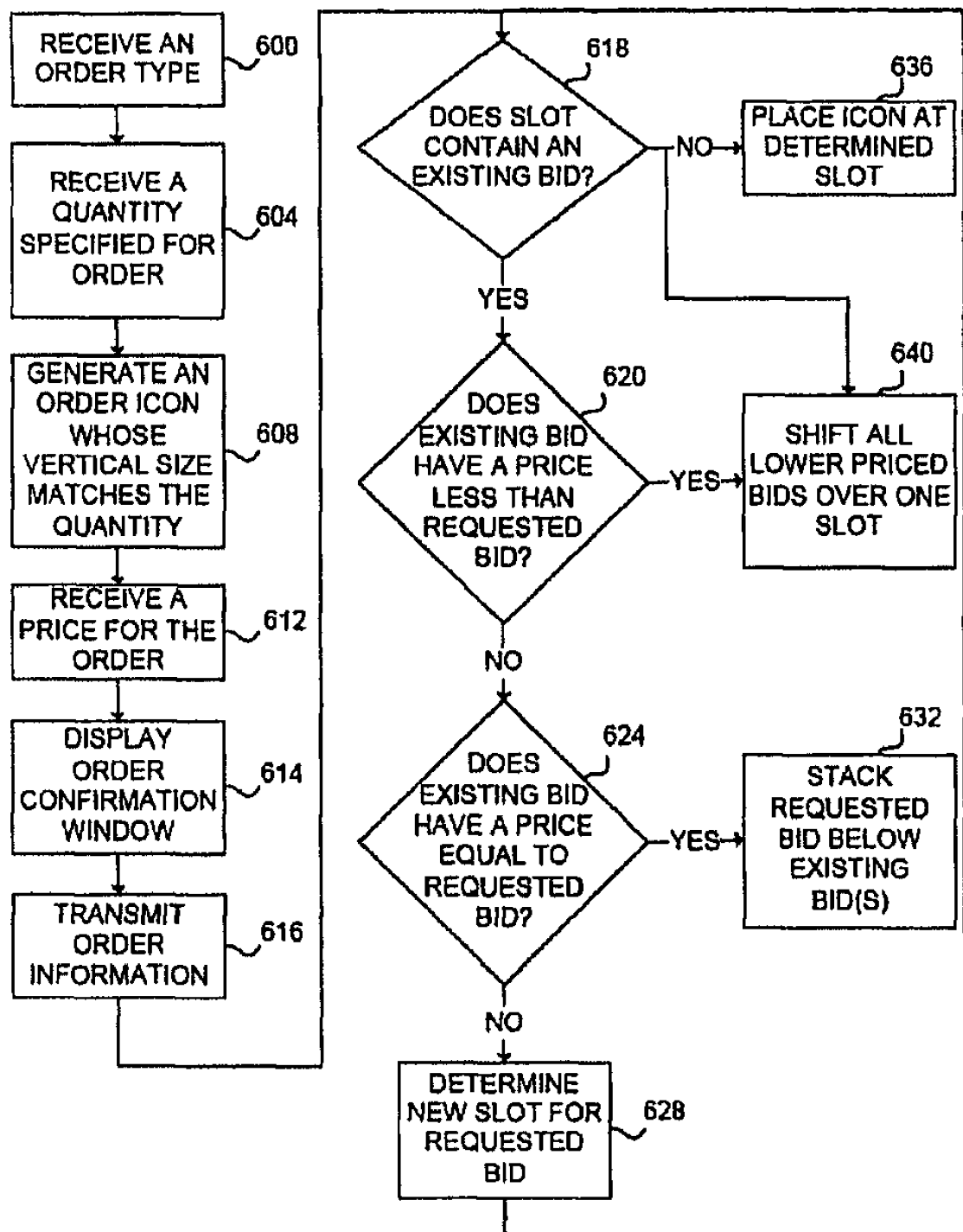


FIG. 6

CERTIFICATE OF CORRECTION (continued)

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7,533,056 B2

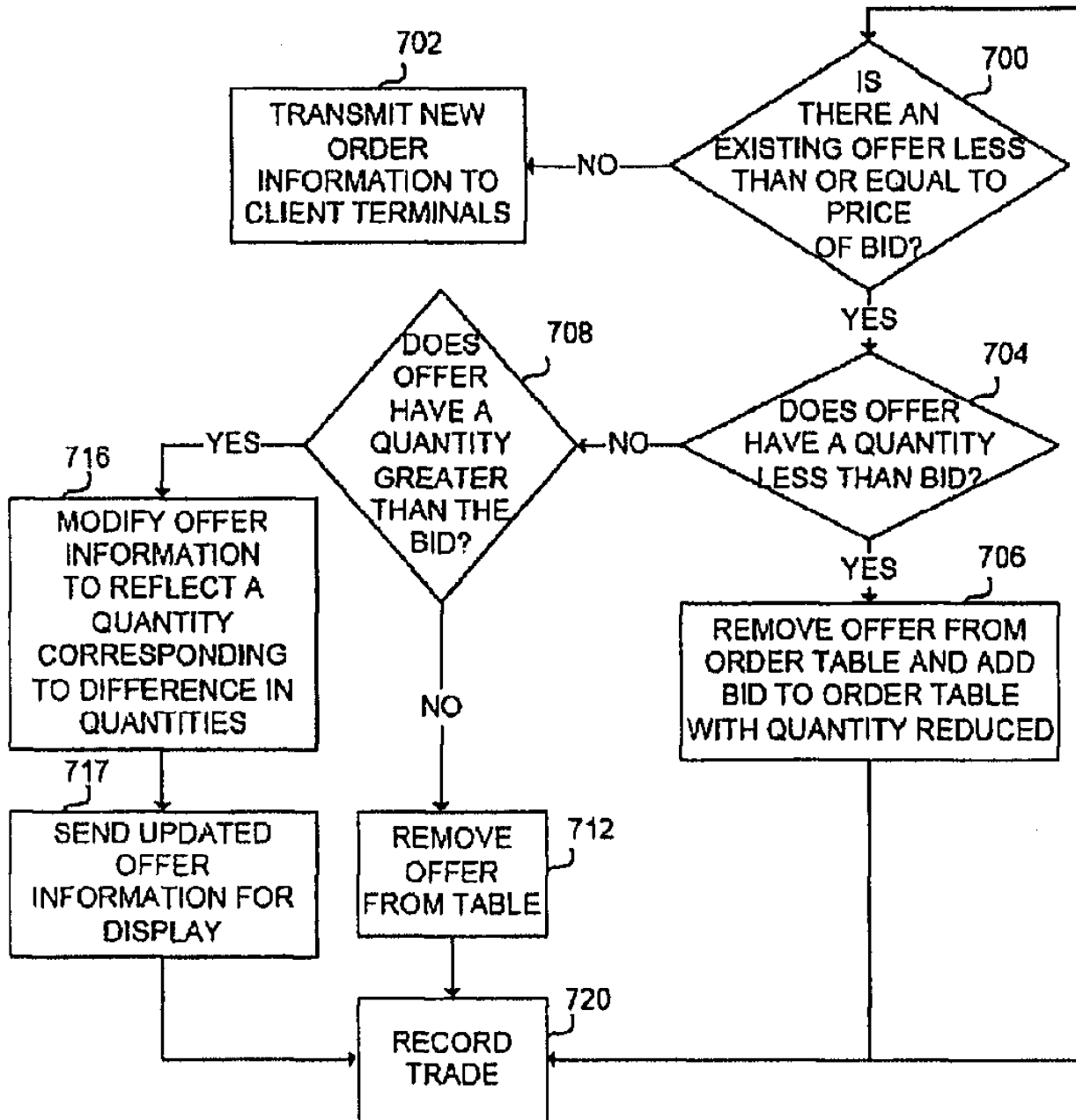


FIG. 7

CERTIFICATE OF CORRECTION (continued)

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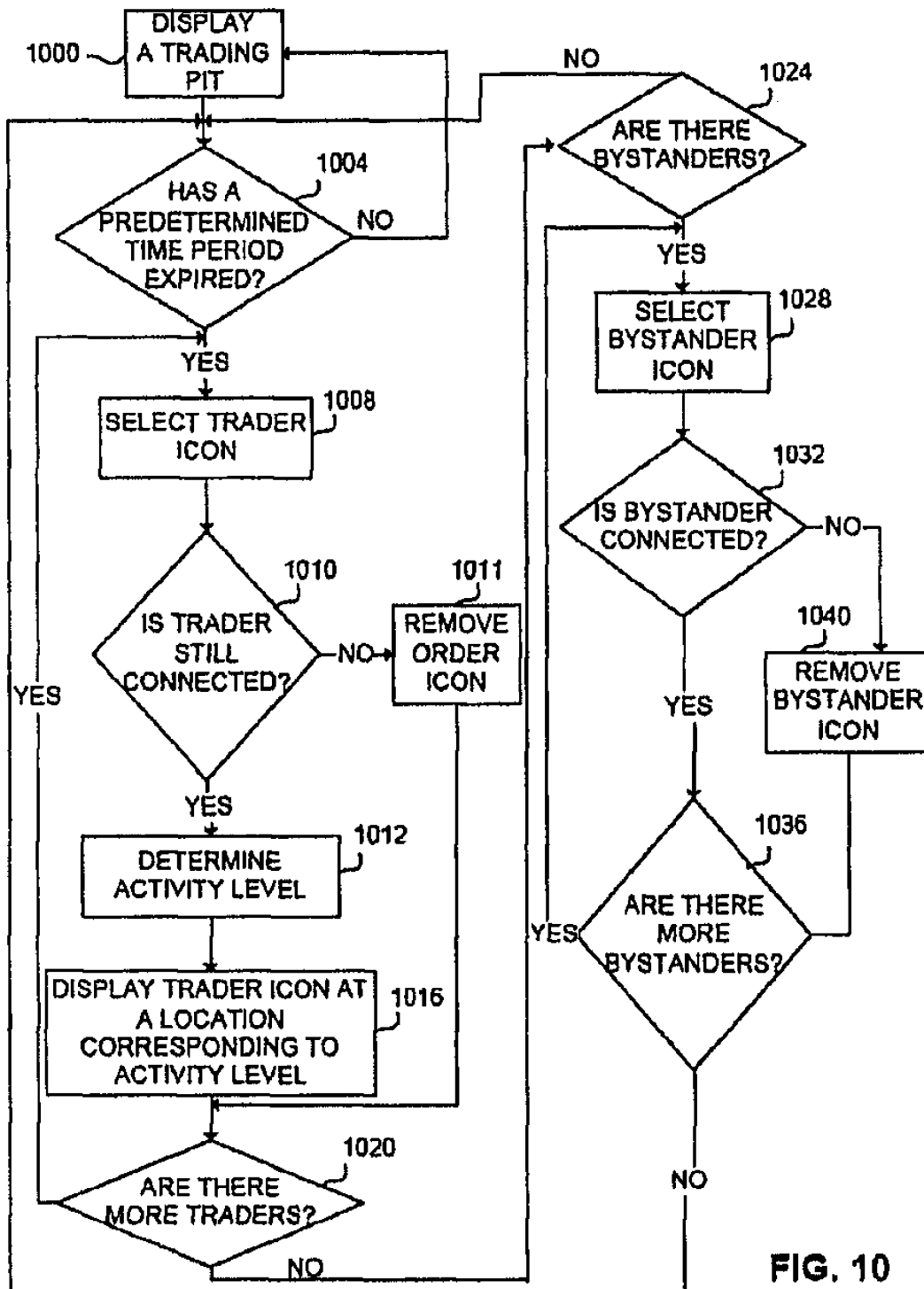


FIG. 10

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

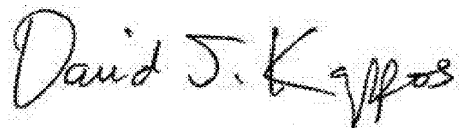
PATENT NO. : 7,533,056 B2
APPLICATION NO. : 11/417544
DATED : May 12, 2009
INVENTOR(S) : Richard W. Friesen et al.

Page 1 of 2

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

The Title Page, showing the illustrative figure, should be deleted and substitute therefor the attached title page.

Signed and Sealed this
Nineteenth Day of April, 2011

A handwritten signature in black ink, reading "David J. Kappos". The signature is written in a cursive, flowing style with a large initial "D" and a stylized "K".

David J. Kappos
Director of the United States Patent and Trademark Office

CERTIFICATE OF CORRECTION (continued)

Page 2 of 2

(12) **United States Patent**
Friesen et al.(10) **Patent No.:** **US 7,533,056 B2**(45) **Date of Patent:** ***May 12, 2009**(54) **USER INTERFACE FOR AN ELECTRONIC TRADING SYSTEM**

FOREIGN PATENT DOCUMENTS

EP 0 388 162 A2 * 3/1990

(75) Inventors: **Richard W. Friesen**, Fairfax, CA (US);
Peter C. Hart, San Rafael, CA (US)

(Continued)

(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

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(Continued)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

Primary Examiner—James P Trammell
Assistant Examiner—Daniel L Greene(74) *Attorney, Agent, or Firm*—McDonnell Boehnen Hulbert & Berghoff LLP

This patent is subject to a terminal disclaimer.

(57) **ABSTRACT**(21) Appl. No.: **11/417,544**(22) Filed: **May 3, 2006**(65) **Prior Publication Data**

US 2006/0265318 A1 Nov. 23, 2006

Related U.S. Application Data

(63) Continuation of application No. 09/289,550, filed on Apr. 9, 1999, now Pat. No. 7,212,999.

(51) **Int. Cl.**
G06Q 40/00 (2006.01)(52) **U.S. Cl.** **705/37; 705/35; 345/440.2**(58) **Field of Classification Search** **705/35, 705/37; 345/440.2**

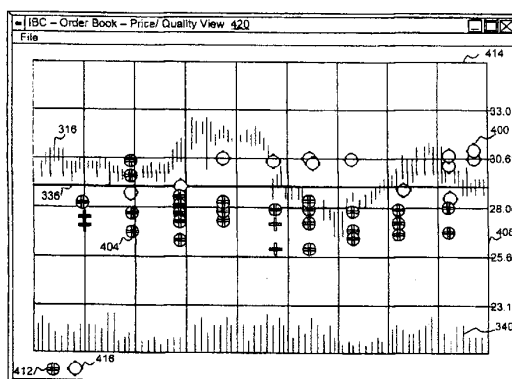
See application file for complete search history.

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A user interface for an electronic trading exchange is provided which allows a remote trader to view in real time bid orders, offer orders, and trades for an item, and optionally one or more sources of contextual data. Individual traders place orders on remote client terminals, and this information is routed to a transaction server. The transaction server receives order information from the remote terminals, matches a bid for an item to an offer for an item responsive to the bid corresponding with the offer, and communicates outstanding bid and offer information, and additional information (such as trades and contextual data) back to the client terminals. Each client terminal displays all of the outstanding bids and offers for an item, allowing the trader to view trends in orders for an item. A priority view is provided in which orders are displayed as tokens at locations corresponding to the values of the orders. The size of the tokens reflects the quantity of the orders. An alternate view positions order icons at a location which reflects the value and quantity of the order. Additionally, contextual data for the item is also displayed to allow the trader to consider as much information as possible while making transaction decisions. A pit panel view is also provided in which traders connected to the pit are represented by icons, and are displayed corresponding to an activity level of the trader.

(Continued)

15 Claims, 11 Drawing Sheets



US007676411B2

(12) **United States Patent**
Kemp, II et al.

(10) **Patent No.:** **US 7,676,411 B2**
 (45) **Date of Patent:** ***Mar. 9, 2010**

(54) **CLICK BASED TRADING WITH INTUITIVE GRID DISPLAY OF MARKET DEPTH**

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(75) Inventors: **Gary Allan Kemp, II**, Winnetka, IL (US); **Jens-Uwe Schluetter**, Evanston, IL (US); **Harris Brumfield**, Chicago, IL (US)

(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

(Continued)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 288 days.

EP 1 319 211 B1 4/1998

This patent is subject to a terminal disclaimer.

(Continued)

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(21) Appl. No.: **11/585,907**

(22) Filed: **Oct. 25, 2006**

Non-final Office Action mailed Oct. 17, 2008 for U.S. Appl. No. 11/415,163.

(65) **Prior Publication Data**

(Continued)

US 2007/0038556 A1 Feb. 15, 2007

Related U.S. Application Data

(63) Continuation of application No. 11/415,163, filed on May 2, 2006, which is a continuation of application No. 10/237,131, filed on Sep. 9, 2002, now abandoned, which is a continuation of application No. 09/590,692, filed on Jun. 9, 2000, now Pat. No. 6,772,132.

(60) Provisional application No. 60/186,322, filed on Mar. 2, 2000.

(51) **Int. Cl.**
G06Q 40/00 (2006.01)

(52) **U.S. Cl.** **705/35**

(58) **Field of Classification Search** 705/35-45
 See application file for complete search history.

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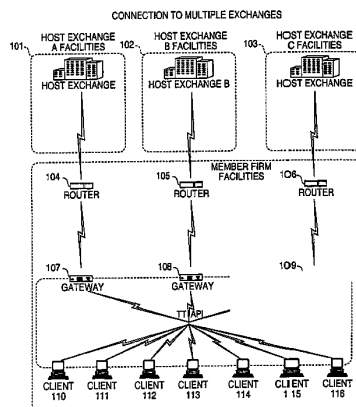
Primary Examiner—Richard Weisberger

(74) *Attorney, Agent, or Firm*—McDonnell Boehnen Hulbert & Berghoff LLP

(57) **ABSTRACT**

A method and system for reducing the time it takes for a trader to place a trade when electronically trading on an exchange, thus increasing the likelihood that the trader will have orders filled at desirable prices and quantities. The “Mercury” display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

28 Claims, 6 Drawing Sheets



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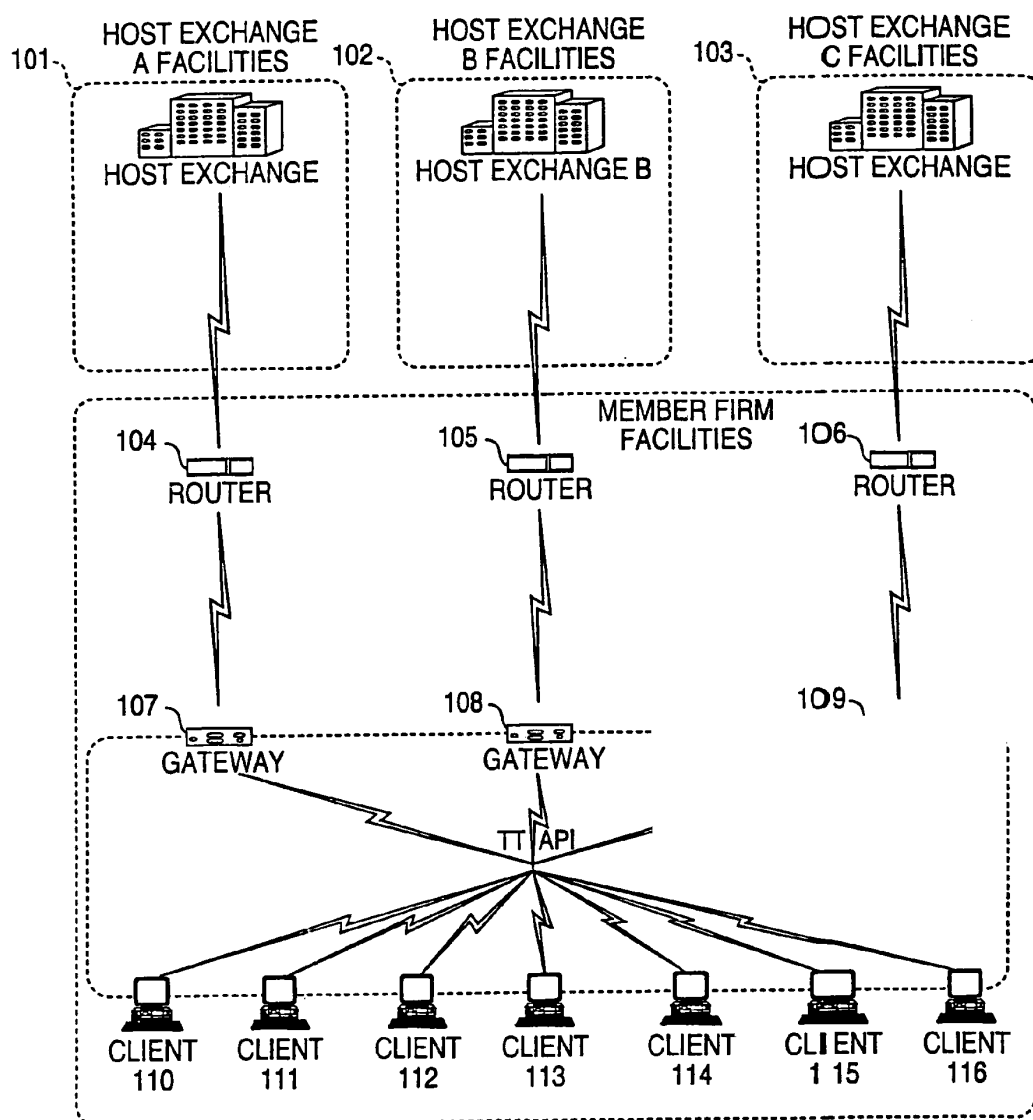
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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



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FIG. 2

	201	202	203	204	205				
)))))				
	Contract	Depth	BidQty	BidPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

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FIG. 3

SYCOM FGBL DEC99						
E/W		10:48:44		BidQ	AskQ	Prc
1009	L	3			104	99
		5			24	98
1010	R	720			33	97
		10			115	96
1011	X	0			32	95
		10			27	94
1012	10	1H			63	93
		50			45	92
1013	50	3H			28	91
		1K			20	90
1014	S 0	CLR		18	89	
		W 24		97	88	
1015	S 0	+		30	87	
		W 7		43	86	
1016	X	NET 0		110	85	
		10		23	84	
1017	17	NET REAL		31	83	
		10		125	82	
1018	B 0			21	81	
1019	W 15					
1020	B 0					
1021	W 13					

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FIG. 4

SYCOM FGBL DEC99							
E/W	10:48:44		BidQ	AskQ	Prc	LtQ	
	L	3		104	99		
	R	5		24	98		
	720			33	97		
	×	10		115	96		
	0			32	95		
	10	1H		27	94		
	50	3H		63	93	10	1101
S 10 W 14	1K	5H					
	CLR		43		92		
	×	10	125		91		
	17	▼	97		90		
B 0 W 15	CXL		18		89		
B 0 W 13	+	-	97		88		
	NET 0		30		87		
			43		86		
B 0 W 17	NET REAL		110		85		
			23		84		
			31		83		
			125		82		
			21		81		

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FIG. 5

SYCOM FGBL DEC99							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E/W	10:48:44		BidQ	AskQ	Prc	LTQ			
	L	3		104	99				
	R	5		24	98				
	720			33	97				
	×	10		115	96				
	0			32	95				
	10	1H		27	94				
	50	3H		63	93				
S 0 W 24	1K	5H		45	92				
S 0 W 7	CLR			28	91				
	×	10		20	90	10			
	17	▼		18	89				
B 0 W 15	CXL		97		88				
B 0 W 13	+	-	30		87				
	NET 0		43		86				
			110		85				
B 0 W 17	NET REAL		23		84				
			31		83				
			125		82				
			21		81				

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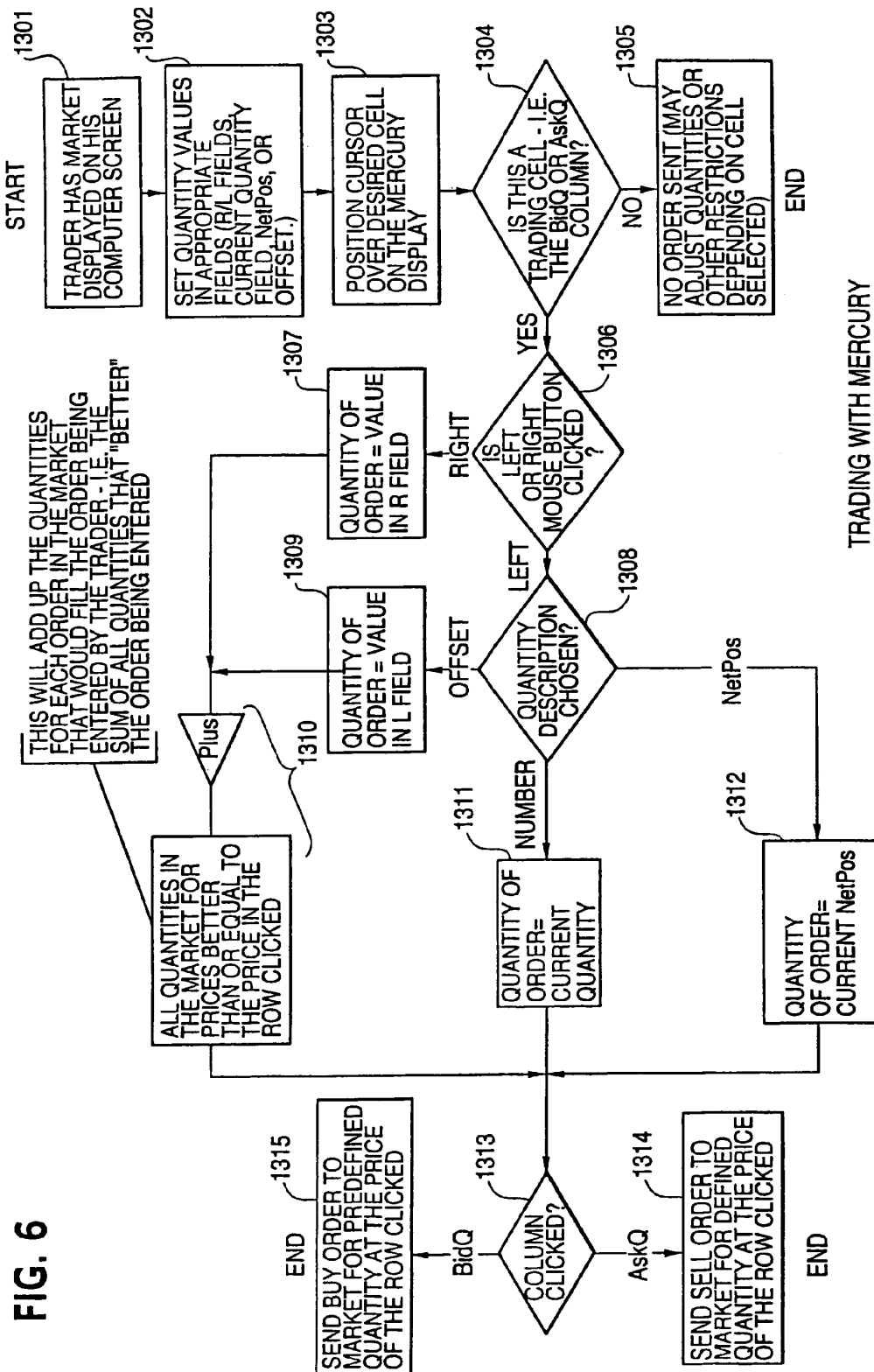
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**CLICK BASED TRADING WITH INTUITIVE
GRID DISPLAY OF MARKET DEPTH****PRIORITY**

The present application is a continuation of Ser. No. 11/415,163, filed May 2, 2006, which is a continuation of Ser. No. 10/237,131, filed Sep. 9, 2002, which is a continuation of Ser. No. 09/590,692, filed Jun. 9, 2000, which is now U.S. Pat. No. 6,772,132, issued Aug. 3, 2004, which claims priority to a U.S. provisional application 60/186,322, filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

The present application claims priority to a U.S. Provisional Patent Application entitled "Market Depth Display Click Based Trading and Mercury Display" filed Mar. 2, 2000, the contents of which are incorporated herein by reference.

FIELD OF INVENTION

The present invention is directed to the electronic trading of commodities. Specifically, the invention provides a trader with a versatile and efficient tool for executing trades. It facilitates the display of and the rapid placement of trade orders within the market trading depth of a commodity, where a commodity includes anything that can be traded with quantities and/or prices.

BACKGROUND OF THE INVENTION

At least 60 exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through three types of structures: high speed data lines, high speed communications servers and the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops. The trading screens enable traders to enter and execute orders,

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obtain market quotes, and monitor positions. The range and quality of features available to traders on their screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

The world's stock, bond, futures and options exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analytics can significantly improve his own or his firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies and requires the same information to and from every trader. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of this information, the market will not accept the order. This input and output of information is the same for every trader.

With these variables being constant, a competitive speed advantage must come from other aspects of the trading cycle. When analyzing the time it takes to place a trade order for a given commodity, various steps contribute in different amounts to the total time required. Approximately 8% of the total time it takes to enter an order elapses between the moment the host generates the price for the commodity and the moment the client receives the price. The time it takes for the client application to display the price to the trader amounts to approximately 4%. The time it takes for a trade order to be transmitted to the host amounts to approximately 8%. The remainder of the total time it takes to place an order, approximately 80%, is attributable to the time required for the trader to read the prices displayed and to enter a trade order. The present invention provides a significant advantage during the slowest portion of the trading cycle—while the trader manually enters his order. Traders recognize that the value of time savings in this portion may amount to millions of dollars annually.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which he wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before he could enter the order, he may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that he will miss his price and the more likely he will make money.

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SUMMARY OF THE INVENTION

The inventors have developed the present invention which overcomes the drawbacks of the existing trading systems and dramatically reduces the time it takes for a trader to place a trade when electronically trading on an exchange. This, in turn, increases the likelihood that the trader will have orders filled at desirable prices and quantities.

The "Mercury" display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently.

Specifically, the present invention is directed to a graphical user interface for displaying the market depth of a commodity traded in a market, including a dynamic display for a plurality of bids and for a plurality of asks in the market for the commodity and a static display of prices corresponding to the plurality of bids and asks. In this embodiment the pluralities of bids and asks are dynamically displayed in alignment with the prices corresponding thereto. Also described herein is a method and system for placing trade orders using such displays.

These embodiments, and others described in greater detail herein, provide the trader with improved efficiency and versatility in placing, and thus executing, trade orders for commodities in an electronic exchange. Other features and advantages of the present invention will become apparent to those skilled in the art from the following detailed description. It should be understood, however, that the detailed description and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the invention includes all such modifications.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates the Mercury display of the present invention;

FIG. 4 illustrates the Mercury display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a Mercury display with parameters set in order to exemplify the Mercury trading method; and

FIG. 6 is a flowchart illustrating the process for Mercury display and trading.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, the present invention provides a display and trading method to ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to place trade orders quickly and efficiently. A commodity's market depth is the current bid and ask prices and quantities in the market. The display and trading method of the invention increase the likelihood that the trader will be able to execute orders at desirable prices and quantities.

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In the preferred embodiment, the present invention is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with the exchange to receive and transmit market, commodity, and trading order information. It is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. It is envisioned that the system of the present invention can be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein. The scope of the present invention is not limited by the type of terminal or device used. Further, the specification refers to a single click of a mouse as a means for user input and interaction with the terminal display as an example of a single action of the user. While this describes a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user's single action. Rather, any action by a user within a short period of time, whether comprising one or more clicks of a mouse button or other input device, is considered a single action of the user for the purposes of the present invention.

The system can be configured to allow for trading in a single or in multiple exchanges simultaneously. Connection of the system of the present invention with multiple exchanges is illustrated in FIG. 1. This figure shows multiple host exchanges **101-103** connected through routers **104-106** to gateways **107-109**. Multiple client terminals **110-116** for use as trading stations can then trade in the multiple exchanges through their connection to the gateways **107-109**. When the system is configured to receive data from multiple exchanges, then the preferred implementation is to translate the data from various exchanges into a simple format. This "translation" function is described below with reference to FIG. 1. An applications program interface ("TT API" as depicted in the figure) translates the incoming data formats from the different exchanges to a simple preferred data format. This translation function may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, the storage at gateway servers and at the client workstations, and/or other external storage cache historical data such as order books which list the client's active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed at one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

The preferred embodiments of the present invention include the display of "Market Depth" and allow traders to view the market depth of a commodity and to execute trades within the market depth with a single click of a computer mouse button. Market Depth represents the order book with the current bid and ask prices and quantities in the market. In other words, Market Depth is each bid and ask that was entered into the market, subject to the limits noted below, in addition to the inside market. For a commodity being traded, the "inside market" is the highest bid price and the lowest ask price.

The exchange sends the price, order and fill information to each trader on the exchange. The present invention processes this information and maps it through simple algorithms and mapping tables to positions in a theoretical grid program or any other comparable mapping technique for mapping data to

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a screen. The physical mapping of such information to a screen grid can be done by any technique known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

How far into the market depth the present invention can display depends on how much of the market depth the exchange provides. Some exchanges supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user of the present invention can also chose how far into the market depth to display on his screen.

FIG. 2 illustrates a screen display of an invention described in a commonly owned co-pending application entitled "Click Based Trading with Market Depth Display" Ser. No. 11/415, 189, filed on May 2, 2006, the contents of which are incorporated herein by reference. This display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the "inside market" for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the "market depth" for the commodity being traded. In the preferred embodiment of the present invention, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market—row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string "CDH0". The Depth column 208 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red indicates that the Market Depth has failed to receive the data

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from the server and has "timed out." Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity): the quantity for each working bid, BidPrc (Bid Price): the price for each working bid, AskPrc (Ask Price): the price for each working ask, AskQty (Ask Quantity): the quantity for each working ask, LastPrc (st Price): the price for the last bid and ask that were matched in the market and LastQty (Last Quantity): the quantity traded at the last price. Total represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than existing systems. Traders gain a significant advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels. If a large amount of bids or asks are in the market near the trader's position, he may feel he should sell or buy before the inside market reaches the morass of orders. A lack of orders above or below the inside market might prompt a trader to enter orders near the inside market. Without seeing the market depth, no such strategies could be utilized. Having the dynamic market depth, including the bid and ask quantities and prices of a traded commodity aligned with and displayed below the current inside market of the commodity conveys the information to the user in a more intuitive and easily understandable manner. Trends in the trading of the commodity and other relevant characteristics are more easily identifiable by the user through the use of the present invention.

Various abbreviations are used in the screen displays, and specifically, in the column headings of the screen displays reproduced herein. Some abbreviations have been discussed above. A list of common abbreviations and their meanings is provided in Table 1.

TABLE I

Abbreviations			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Month	Expiration Month/Year	TheoBid	Theoretical Bid Price
Bid Mbr(1)	Bid Member ID	TheoAsk	Theoretical Ask Price
WrkBuys(2)	Working Buys for entire Group ID	QAct	Quote Action (Sends individual quotes)
BidQty	Bid Quantity	BQQ	Test Bid Quote Quantity
ThreshBid(6)	Threshold Bid Price	BQP	Test Bid Quote Price
BidPrc	Bid Price	Mkt BQQ	Market Bid Quote Quantity
Bid Qty Accum	Accumulated Bid Quantity	Mkt BQP	Market Bid Quote Price
BidPrc Avg	Bid Price Average	Quote	Checkbox activates/deactivates contract for quoting
AskPrc Avg	Ask Price Average	Mkt AQQ	Market Ask Quote Quantity
AskQty Accum	Accumulated Ask Quantity	Mkt AQP	Market Ask Quote Price
AskPrc	Ask Price	AQP	Ask Quote Price
ThreshAsk(6)	Threshold Ask Price	AQQ	Ask Quote Quantity
AskQty	Ask Quantity	Imp BidQty(5)	Implied Bid Quantity
WrkSells(2)	Working Sells for entire Group ID	Imp BidPrc(5)	Implied Bid Price
Ask Mbr(1)	Ask Member ID	Imp AskQty(5)	Implied Ask Quantity
NetPos	Net Position	Imp AskPrc(5)	Implied Ask Price
FFNetPos	Fast Fill Net Position	Gamma(3)	Change in Delta given 1 pt change in underlying
LastPrc	Last Price	Delta(3)	Change in price given 1 pt change in underlying
LastQty	Last Quantity	Vola(3)	Percent volatility
Total	Total Traded Quantity	Vega(3)	Price change given 1% change in Vola
High	High Price	Rho(3)	Price change given 1% change in interest rate
Low	Low Price	Theta(3)	Price change for every day that elapses

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TABLE I-continued

Abbreviations			
COLUMN	DESCRIPTION	COLUMN	DESCRIPTION
Open	Opening Price	Click Trd	Activate/deactivate click trading by contract
Close	Closing Price	S (Status)	Auction, Closed, FastMkt, Not Tradable, Pre-trading, Tradable, S = post-trading
Chng TheoPrc	Last Price-Last Close Theoretical Price	Expiry	Expiration Month/Year

As described herein, the display and trading method of the present invention provide the user with certain advantages over systems in which a display of market depth, as shown in FIG. 2, is used. The Mercury display and trading method of the present invention ensure fast and accurate execution of trades by displaying market depth on a vertical or horizontal plane, which fluctuates logically up or down, left or right across the plane as the market prices fluctuates. This allows the trader to trade quickly and efficiently. An example of such a Mercury display is illustrated in the screen display of FIG. 3.

The display of market depth and the manner in which traders trade within the market depth can be effected in different manners, which many traders will find materially better, faster and more accurate. In addition, some traders may find the display of market depth to be difficult to follow. In the display shown in FIG. 2, the market depth is displayed vertically so that both Bid and Ask prices descend the grid. The Bid prices descend the market grid as the prices decrease. Ask prices also descend the market grid as these prices actually increase. This combination may be considered counterintuitive and difficult to follow by some traders.

The Mercury display overcomes this problem in an innovative and logical manner. Mercury also provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display materially simplifies the trading system by entering and tracking trades in an extremely efficient manner. Mercury displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle. In turn, Mercury further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the Mercury display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices. An example of this display is shown in FIG. 3.

Bid quantities are in the column 1003 labeled BidQ and ask quantities are in column 1004 labeled AskQ. The representative ticks from prices for the given commodity are shown in column 1005. The column does not list the whole prices (e.g. 95.89), but rather, just the last two digits (e.g. 89). In the example shown, the inside market, cells 1020, is 18 (best bid quantity) at 89 (best bid price) and 20 (best ask quantity) at 90 (best ask price). In the preferred embodiment of the invention, these three columns are shown in different colors so that the trader can quickly distinguish between them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the Bid and Ask columns however, are dynamic; that is, they move up and

down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column 1006 shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column 1001 labeled E/W (entered/working) displays the current status of the trader's orders. The status of each order is displayed in the price row where it was entered. For example, in cells 1007, the number next to S indicates the number of the trader's ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that orders are entered or working at that price. In cells 1008, the number next to B indicates the number of the trader's ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of the trader's ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column 1002. For example, "10:48:44" in cell 1009 shows the actual time of day. The L and R fields in cell 1010 indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under Mercury. Below the L and R fields, in cell 1011, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen contract. Cell 1012, "X 10", displays the Net Quantity, the current position of the trader on the chosen contract. The number "10" represents the trader's buys minus sells. Cell 1013 is the "Current Quantity"; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells 1014. These buttons increase the current quantity by the indicated amount; for example, "10" will increase it by 10; "H" will increase it by 100; "K" will increase it by 1000. Cell 1015 is the Clear button; clicking this button will clear the Current Quantity field. Cell 1016 is the Quantity Description; this is a pull down menu allowing the trader to choose from three Quantity Descriptions. The pull down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing "Offset" in this field will enable the L/R buttons of cell 1010. Choosing "NetPos" in this field will set the current Net Quantity (trader's net position) as the trader's quantity for his next trade. Cell 1017 are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (-). Cell 1018 is used to invoke Net 0; clicking this button will reset the Net Quantity

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(cell **1011**) to zero. Cell **1019** is used to invoke Net Real; clicking this button will reset the Net Quantity (cell **1011**) to its actual position.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. **4** shows a screen displaying the same market as that of FIG. **3** but at a later interval where the inside market, cells **1101**, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. **3** and **4**, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column. Market Depth similarly ascends and descends the price column, leaving a vertical history of the market.

As the market ascends or descends the price column, the inside market might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system of the present invention addresses this problem with a one click centering feature. With a single click at any point within the gray area, **1021**, below the "Net Real" button, the system will re-center the inside market on the trader's screen. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-center the inside market on the trader's screen.

The same information and features can be displayed and enabled in a horizontal fashion. Just as the market ascends and descends the vertical Mercury display shown in FIGS. **3** and **4**, the market will move left and right in the horizontal Mercury display. The same data and the same information gleaned from the dynamical display of the data is provided. It is envisioned that other orientations can be used to dynamically display the data and such orientations are intended to come within the scope of the present invention.

Next, trading commodities, and specifically, the placement of trade orders using the Mercury display is described. Using the Mercury display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. Then he can trade with single clicks of the right or left mouse button. The following equations are used by the system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked, R=Value in R field, L=Value in L field, Q=Current Quantity, Q_a =Total of all quantities in AskQ column at an equal or better price than P, Q_b =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order sent to market.

Any order entered using right mouse button

$$Bo=(Q_a+R)P \quad (\text{Eq. 1})$$

If BidQ field clicked.

$$So=(Q_b+R)P \quad (\text{Eq. 2})$$

If AskQ field clicked.

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo=(Q_a+L)P \quad (\text{Eq. 3})$$

If BidQ field clicked.

$$So=(Q_b+L)P \quad (\text{Eq. 4})$$

If AskQ field clicked.

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If "number" mode chosen in Quantity Description field then:

$$Bo=QP \quad (\text{Eq. 5})$$

$$So=QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo=NP \quad (\text{Eq. 7})$$

$$So=NP \quad (\text{Eq. 8})$$

Orders can also be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader could also add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, he will enter an order in the market. The parameters of the order depend on which mouse button he clicks and what preset values he set.

Using the screen display and values from FIG. **5**, the placement of trade orders using the Mercury display and trading method is now described using examples. A left click on the **18** in the BidQ column **1201** will send an order to market to sell 17 lots (quantity # chosen on the Quantity Description pull down menu cell **1204**) of the commodity at a price of 89 (the corresponding price in the Prc column **1203**). Similarly, a left click on the **20** in the AskQ column **1202** will send an order to market to buy 17 lots at a price of 90.

Using the right mouse button, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field **1205**. Thus, a right click in the AskQ column **1202** in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150. 150 is the sum of all the quantities 30, 97, 18 and 5. 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column **1201** because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field **1205**.

Similarly, a right click in the BidQ column **1201** at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price there are no quantities in the AskQ column **1202** that equal or better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field, which is 5.

An order entered with the left mouse button and the "Offset" option chosen in the quantity description field **1204** will be calculated in the same way as above, but the quantity in the L field **1206** will be added instead of the quantity in the R field **1205**. Thus, a left click in the BidQ column **1201** in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. 96 is the sum of all the quantities 45, 28, 20 and 3. 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column **1202** because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field **1206**.

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The values in the L or R fields may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column **1202** in the 87 price row, if the R field was -5, the total quantity sent to market would be 140 (30+97+18+ (-5)).

If a trader chose the "NetPos" option in the quantity description field **1204**, a right click would still work as explained above. A left click would enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the trader's current position on the chosen contract. In other words, if the trader has bought 10 more contracts than he has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field **1204**.

This embodiment of the invention also allows a trader to delete all of his working trades with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column **1207**. This allows a trader to exit the market immediately. Traders will use this feature when they are losing money and want to stop the losses from piling up. Traders may also use this feature to quickly exit the market upon making a desired profit. The invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Entered/Working (E/W) column **1208** will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, he can delete these orders with a single click.

The process for placing trade orders using the Mercury display and trading method of the present invention as described above is shown in the flowchart of FIG. 6. First, in step **1301**, the trader has the Mercury display on the trading terminal screen showing the market for a given commodity. In step **1302**, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull down menu. In step **1303**, the mouse pointer is positioned and clicked over a cell in the Mercury display by the trader. In step **1304**, the system determines whether the cell clicked is a tradeable cell (i.e. in the AskQ column or BidQ column). If not, then in step **1305**, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step **1306**, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step **1307**, the system will use the quantity in the R field when it determines the total quantity of the order in step **1310**. If the left button was clicked, then in step **1308**, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step **1309**, will use the quantity in the L field when it determines the total quantity of the order in step **1310**. If NetPos was chosen, then the system, in step **1312**, will determine that the total quantity for the trade order will be current NetPos value, i.e. the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step **1311**, the system will determine that the total quantity for the trade order will be the current quantity entered. In step **1310**, the system will determine that the total quantity for the trade

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order will be the value of the R field (if step **1307** was taken) or the value of the L field (if step **1309** was taken) plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps **1310**, **1311**, or **1312**, the system, in step **1313**, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step **1314**, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step **1315**, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined.

It should be understood that the above description of the invention and specific examples, while indicating preferred embodiments of the present invention, are given by way of illustration and not limitation. Many changes and modifications within the scope of the present invention may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

We claim:

1. A method of displaying market information relating to and facilitating trading of a commodity being traded on an electronic exchange, the method comprising:

receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plurality of graphical locations in the bid display region, the first graphical location in the bid display region corresponding to a price level associated with the current highest bid price;

upon receipt of market information comprising a new highest bid price, moving the first indicator relative to the price axis to a second graphical location of the plurality of graphical locations in the bid display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new highest bid price, wherein the second graphical location is different from the first graphical location in the bid display region;

dynamically displaying, via the computing device, a second indicator representing quantity associated with at least one trade order to sell the commodity at the current lowest ask price in a first graphical location of the plurality of graphical locations in the ask display region, the first graphical location in the ask display region corresponding to a price level associated with the current lowest ask price;

upon receipt of market information comprising a new lowest ask price, moving the second indicator relative to the price axis to a second graphical location of the plurality

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of graphical locations in the ask display region, the second graphical location corresponding to a price level of the plurality of price levels associated with the new lowest ask price, wherein the second graphical location is different from the first graphical location in the ask display region;

displaying, via the computing device, an order entry region comprising a plurality of graphical areas for receiving single action commands to set trade order prices and send trade orders, each graphical area corresponding to a different price level along the price axis; and

selecting a particular graphical area in the order entry region through a single action of the user input device to both set a price for the trade order and send the trade order having a default quantity to the electronic exchange.

2. The method of claim 1, wherein the order entry region further comprises:

a bid order entry region comprising a plurality of graphical areas for receiving single action commands to send trade orders to buy, each graphical area corresponding to a different price level of the plurality of price levels along the price axis; and

an ask order entry region comprising a plurality of graphical areas for receiving single action commands to send trade orders to sell, each graphical area corresponding to a different price level of the plurality of price levels along the price axis.

3. The method of claim 2, wherein the single action further sets whether the trade order is an order to buy or sell the commodity.

4. The method of claim 2, wherein the bid order entry region overlaps with the bid display region, and wherein the ask order entry region overlaps with the ask display region.

5. The method of claim 4, wherein the overlapping of the bid order entry region with the bid display region allows the user to send trade orders to buy the commodity by positioning the cursor over the first indicator and selecting a graphical area corresponding to the current highest bid price, and wherein overlapping of the ask order entry region with the ask display region allows the user to send trade orders to sell the commodity by positioning the cursor over the second indicator and selecting a graphical area corresponding to the current lowest ask price.

6. The method of claim 1, wherein the trade order is an order to buy the commodity if the position of the cursor at the time of the single action is within a bid order entry region and wherein the trade order is an order to sell the commodity if the position of the cursor at the time of the single action is within an ask order entry region.

7. The method of claim 1, wherein the default quantity is designated to be used for a single trade order.

8. The method of claim 1, wherein the default quantity is designated to be used for a plurality of trade orders.

9. The method of claim 1, further comprising dynamically displaying an entered order indicator at a graphical location aligned with a price level of the plurality of price levels, wherein the entered order indicator represents a user's trade order working at the price level aligned with the entered order indicator.

10. The method of claim 9, further comprising canceling the user's trade order represented by the entered order indicator in response to a single action of the user input device with the cursor of the user input device positioned over the entered order indicator.

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11. The method of claim 1, further comprising receiving a re-centering command to center the inside market in a window of a graphical user interface.

12. The method of claim 1, wherein the bid display region, the ask display region, and the order entry region are displayed vertically or horizontally.

13. The method of claim 1, wherein the bid and ask display regions are displayed separately.

14. The method of claim 1, wherein the plurality of price levels are displayed along the price axis.

15. The method of claim 1, wherein the plurality of price levels do not move except as a result of a manual repositioning command.

16. The method of claim 1, further comprising receiving an input from a user that designates a default quantity to be used for a plurality of trade orders, and receiving a plurality of consecutive single action commands from a user input device, each single action command sending a trade order to the electronic exchange, each trade order having an order quantity based on the default quantity without the user designating the default quantity between the single action commands.

17. The method of claim 16, wherein the plurality of trade orders comprises a combination of trade orders to buy and sell the commodity.

18. The method of claim 1, wherein the single action of the user input device consists of a single click of the user input device.

19. The method of claim 1, wherein the single action of the user input device consists of a double-click of the user input device.

20. The method of claim 2, wherein the single action of the user input device consists of a single click of the user input device.

21. The method of claim 2, wherein the single action of the user input device consists of a double-click of the user input device.

22. The method of claim 10, wherein the single action of the user input device to cancel the trade order consists of a single click of the user input device.

23. The method of claim 10, wherein the single action of the user input device to cancel the trade order consists of a double-click of the user input device.

24. The method of claim 16, wherein the single action command consists of a single click of the user input device.

25. The method of claim 16, wherein the single action command consists of a double-click of the user input device.

26. A computer readable medium having stored therein instructions for execution by a computer to perform the following method steps:

receiving, by a computing device, market information for a commodity from an electronic exchange, the market information comprising an inside market with a current highest bid price and a current lowest ask price;

displaying, via the computing device, a bid display region comprising a plurality of graphical locations, each graphical location in the bid display region corresponding to a different price level of a plurality of price levels along a price axis;

displaying, via the computing device, an ask display region comprising a plurality of graphical locations, each graphical location in the ask display region corresponding to a different price level of the plurality of price levels along the price axis;

dynamically displaying, via the computing device, a first indicator representing quantity associated with at least one trade order to buy the commodity at the current highest bid price in a first graphical location of the plu-

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rality of graphical locations in the bid display region, the
 first graphical location in the bid display region corre-
 sponding to a price level associated with the current
 highest bid price;
 upon receipt of market information comprising a new high- 5
 est bid price, moving the first indicator relative to the
 price axis to a second graphical location of the plurality
 of graphical locations in the bid display region, the sec-
 ond graphical location corresponding to a price level of
 the plurality of price levels associated with the new 10
 highest bid price, wherein the second graphical location
 is different from the first graphical location in the bid
 display region;
 dynamically displaying, via the computing device, a sec- 15
 ond indicator representing quantity associated with at
 least one trade order to sell the commodity at the current
 lowest ask price in a first graphical location of the plu-
 rality of graphical locations in the ask display region, the
 first graphical location in the ask display region corre-
 sponding to a price level associated with the current 20
 lowest ask price;
 upon receipt of market information comprising a new low-
 est ask price, moving the second indicator relative to the
 price axis to a second graphical location of the plurality

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of graphical locations in the ask display region, the sec-
 ond graphical location corresponding to a price level of
 the plurality of price levels associated with the new
 lowest ask price, wherein the second graphical location
 is different from the first graphical location in the ask
 display region;
 displaying, via the computing device, an order entry region
 comprising a plurality of graphical areas for receiving
 single action commands to set trade order prices and
 send trade orders, each graphical area corresponding to
 a different price level along the price axis; and
 selecting a particular graphical area in the order entry
 region through a single action of the user input device to
 both set a price for the trade order and send the trade
 order having a default quantity to the electronic
 exchange.
 27. The computer readable method of claim 26, wherein
 the single action of the user input device consists of a single
 click of the user input device.
 28. The computer readable method of claim 26, wherein
 the single action of the user input device consists of a double-
 click of the user input device.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,676,411 B2
APPLICATION NO. : 11/585907
DATED : March 9, 2010
INVENTOR(S) : Kemp, II et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title Page;

At item (56), add the following to the "Other Publications" section:

--Re-exam Certificate for U.S. Patent No. 6,766,304, issued March 31, 2009--.

--Re-exam Certificate for U.S. Patent No. 6,772,132, issued March 31, 2009--.

At col. 1, line 13-17, please delete the paragraph "The present application claims priority to a U.S. Provisional Patent Application entitled 'Market Depth Display Click Based Trading and Mercury Display' filed Mar. 2, 2000, the contents of which are incorporated by reference herein."

Claim 5, Column 13, lines 37-39: please delete "allows the user to send trade orders to buy the commodity by positioning the curser" and insert --allows a user to send trade orders to buy the commodity by positioning a cursor--.

Claim 6, Column 13, lines 47-48: please delete "the position of the cursor at the time" and insert --a position of a cursor at a time--.

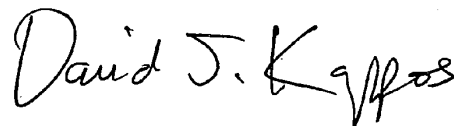
Claim 10, Column 13, line 66: please delete "the cursor" and insert --a cursor--.

Claim 16, Column 14, line 15: please delete "a default quantity" and insert --the default quantity--.

Claim 26, Column 16, line 13: please delete "the user input device" and insert --a user input device--.

Signed and Sealed this

First Day of June, 2010

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style.

David J. Kappos
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,676,411 B2
APPLICATION NO. : 11/585907
DATED : March 9, 2010
INVENTOR(S) : Kemp, II et al.

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

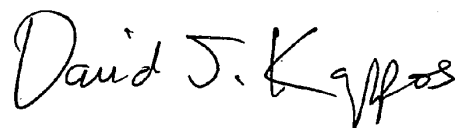
In claim 1, at column 13, line 13, please delete "the user input device" and insert -- a user input device --.

In claim 1, at column 13, line 14, please delete "a price for the trade order" and insert -- a price for a trade order --.

In claim 26, at column 16, line 14, please delete "a price for the trade order" and insert -- a price for a trade order --.

Signed and Sealed this

Tenth Day of August, 2010

A handwritten signature in black ink that reads "David J. Kappos". The signature is written in a cursive, flowing style.

David J. Kappos
Director of the United States Patent and Trademark Office



US007685055B2

(12) **United States Patent**
Brumfield et al.

(10) **Patent No.:** **US 7,685,055 B2**
(45) **Date of Patent:** **Mar. 23, 2010**

(54) **SYSTEM AND METHOD FOR AUTOMATIC REPOSITIONING OF MARKET INFORMATION IN A GRAPHICAL USER INTERFACE**

(75) Inventors: **Harris Brumfield**, Chicago, IL (US);
Jens-Uwe Schluetter, Evanston, IL (US)

(73) Assignee: **Trading Technologies International, Inc.**, Chicago, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/417,547**

(22) Filed: **May 3, 2006**

(65) **Prior Publication Data**

US 2006/0265305 A1 Nov. 23, 2006

Related U.S. Application Data

(63) Continuation of application No. 10/403,881, filed on Mar. 31, 2003, which is a continuation of application No. 10/125,894, filed on Apr. 19, 2002, now Pat. No. 7,389,268, which is a continuation-in-part of application No. 09/971,087, filed on Oct. 5, 2001, now Pat. No. 7,127,424, said application No. 10/125,894 is a continuation-in-part of application No. 09/590,692, filed on Jun. 9, 2000, now Pat. No. 6,772,132, and a continuation-in-part of application No. 09/589,751, filed on Jun. 9, 2000, now Pat. No. 6,938,011.

(60) Provisional application No. 60/238,001, filed on Oct. 6, 2000, provisional application No. 60/186,332, filed on Mar. 2, 2000, provisional application No. 60/325,553, filed on Oct. 1, 2001.

(51) **Int. Cl.**
G06Q 40/00 (2006.01)

(52) **U.S. Cl.** **705/37; 705/35**

(58) **Field of Classification Search** **705/35-45**
See application file for complete search history.

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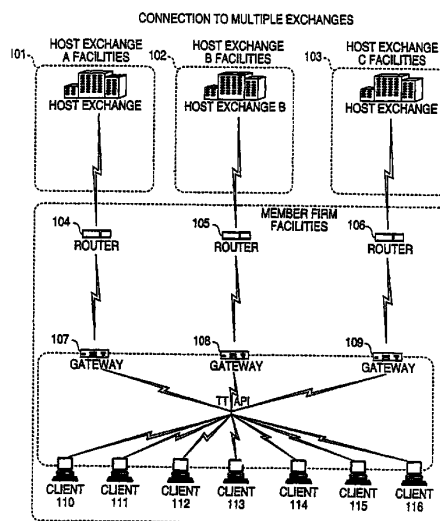
Primary Examiner—Richard C Weisberger

(74) *Attorney, Agent, or Firm*—McDonnell Boehnen Hulbert & Berghoff LLP

(57) **ABSTRACT**

A method for automatically positioning information related to a commodity on a graphical user interface. Market information is displayed on the graphical user interface. The market information may be presented as a number of indicators, corresponding to particular items of interest, that are associated with a static scale. The scale may, for example, represent price. Upon detecting a predetermined condition, the location of the market information is automatically repositioned.

19 Claims, 27 Drawing Sheets



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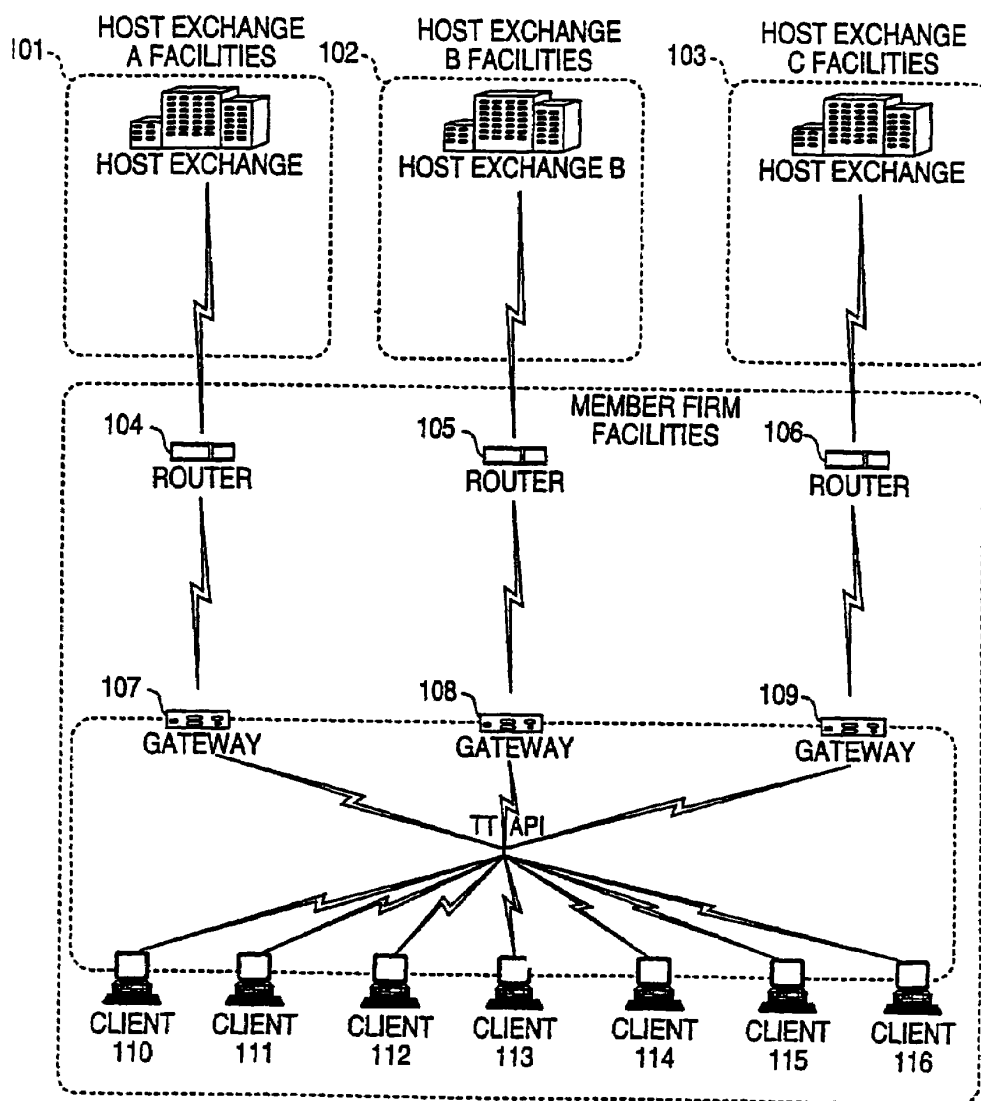
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FIG. 1

CONNECTION TO MULTIPLE EXCHANGES



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FIG. 2

	201	202	203	204	205	206	207	208	
	Contract	Depth	BldQty	BldPrc	AskPrc	AskQty	LastPrc	LastQty	Total
1	CDHO	•	785	7626	7627	21	7627	489	8230
2			626	7625	7629	815			
3			500	7624	7630	600			
4			500	7623	7631	2456			
5			200	7622	7632	800			

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FIG. 3

SYCOM FGBL DEC99									
E/W		10:48:44		BidQ	AskQ	Prc	LTQ		
318		L	3		104	99			
320		R	5		24	98			
322		720			33	97			
324		×	10		115	96			
326		0			32	95			
328		10	1H		27	94			
		50	3H		63	93			
312	S 0	W 24	1K	5H		45	92		
	S 0	W 7	CLR			28	91		
330		×	10		20	90	10		
332		17	▽		18	89			
314	B 0	W 15	CXL		97	88			
	B 0	W 13	+	-	30	87			
334		NET 0			43	86			
336	B 0	W 17	NET REAL		110	85			
338					23	84			
342					31	83			
					125	82			
					21	81			

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FIG. 4

SYCOM FGBL DEC99						[-][][X]	
E/W	10:48:44		BidQ	AskQ	Prc	LTQ	
	L	3		104	99		
	R	5		24	98		
	720			33	97		
	X	10		115	96		
	0			32	95		
	10	1H		27	94		
	50	3H		63	93	10	
S 10 W 14	1K	5H					
	CLR		43		92		
	X	10	125		91		
	17	▽	97		90		
B 0 W 15	CXL		18		89		
B 0 W 13	+	-	97		88		
	NET 0		30		87		
			43		86		
B 0 W 17	NET REAL		110		85		
			23		84		
			31		83		
			125		82		
			21		81		

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FIG. 5

SYCOM FGBL DEC99						
E/W	10:48:44		BidQ	AskQ	Prc	LTQ
510	L	3		104	99	
	R	5		24	98	
508	720			33	97	
	×	10		115	96	
	0			32	95	
	10	1H		27	94	
	50	3H		63	93	
S 0 W 24	1K	5H		45	92	
S 0 W 7	CLR			28	91	
	×	10		20	90	10
	17	▼		18	89	
502	B O W 17	CXL	18		88	
	B O W 13	+ -	97		87	
	B O W 5	NET 0	30		86	
	B O W 15	NET REAL	43		85	
			110		84	
			23		83	
			31		82	
			125		81	
			21			

514

500

506

504

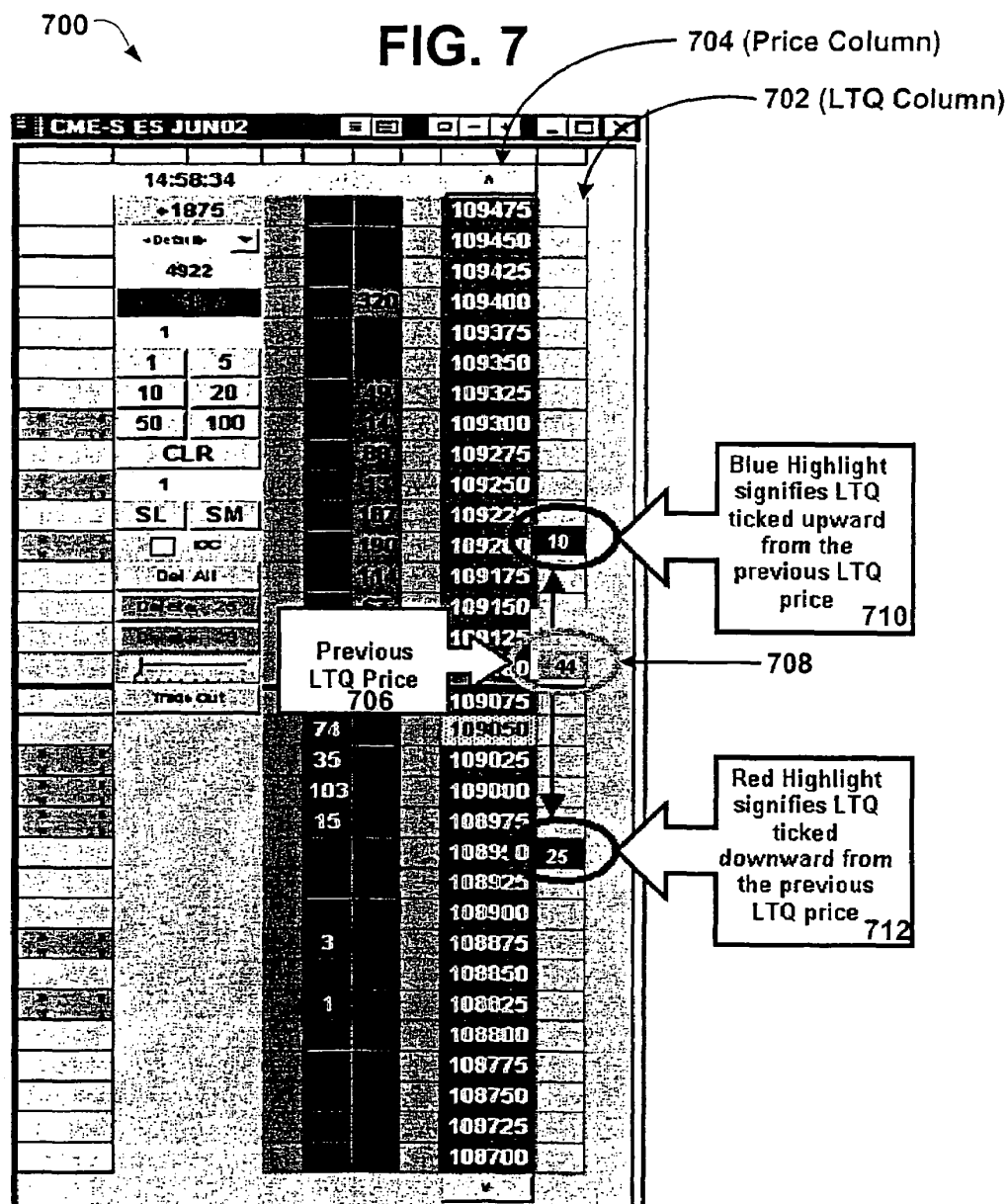
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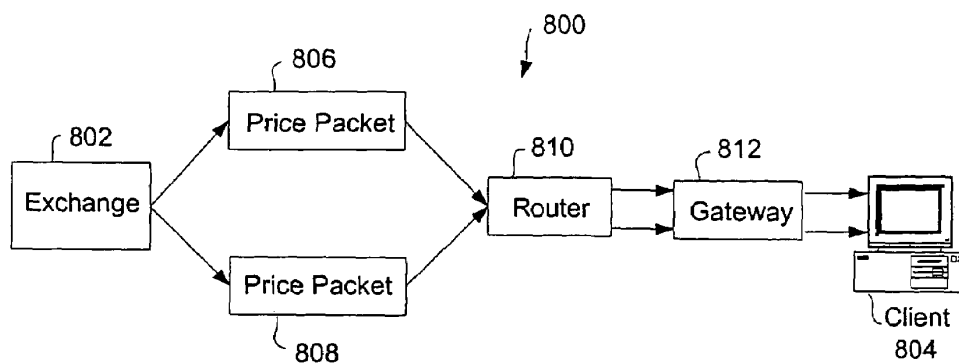


FIG. 8

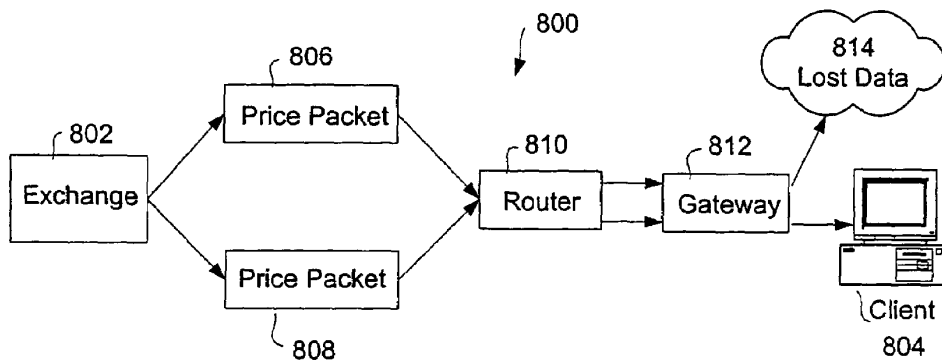


FIG. 9

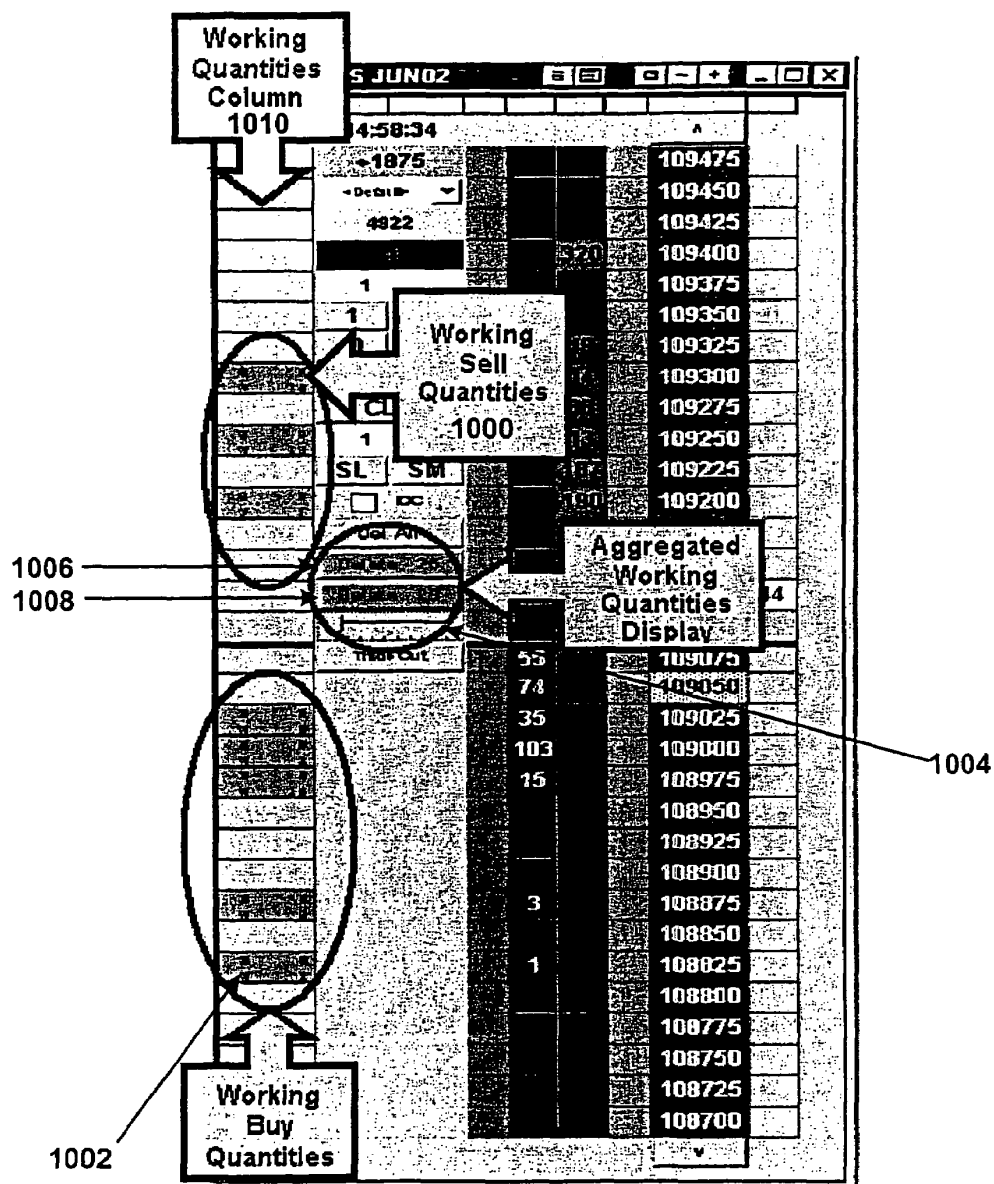
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FIG. 10



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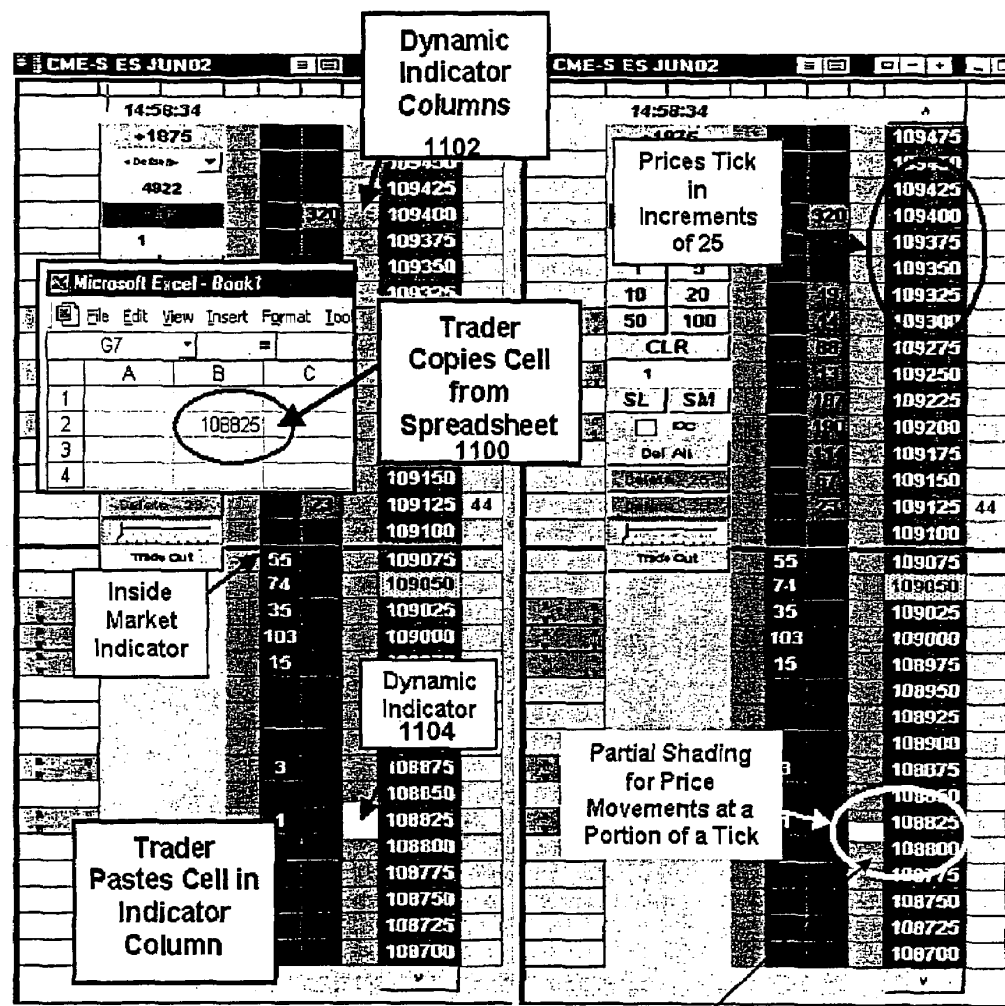
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FIG. 11A

FIG. 11B



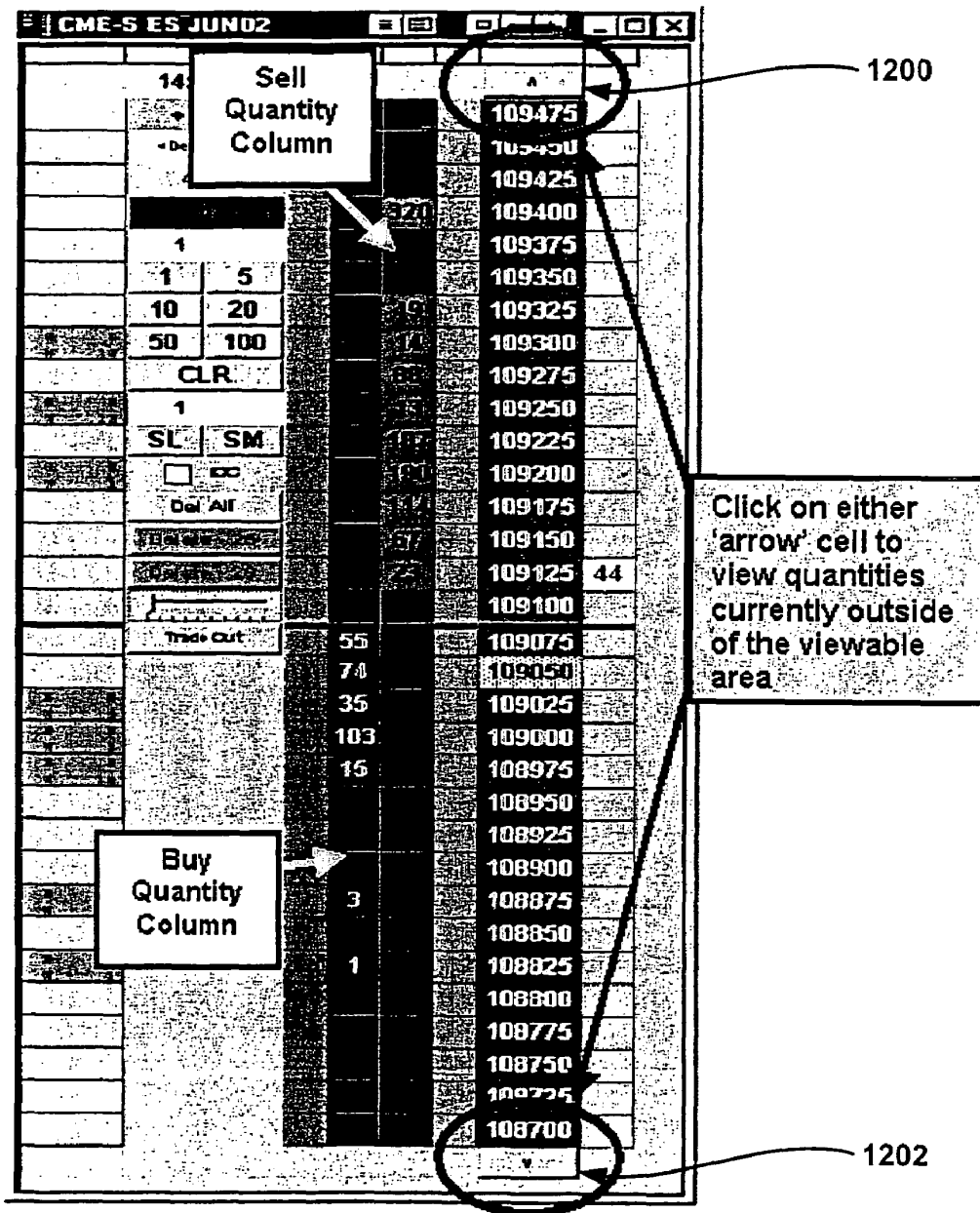
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FIG. 12A



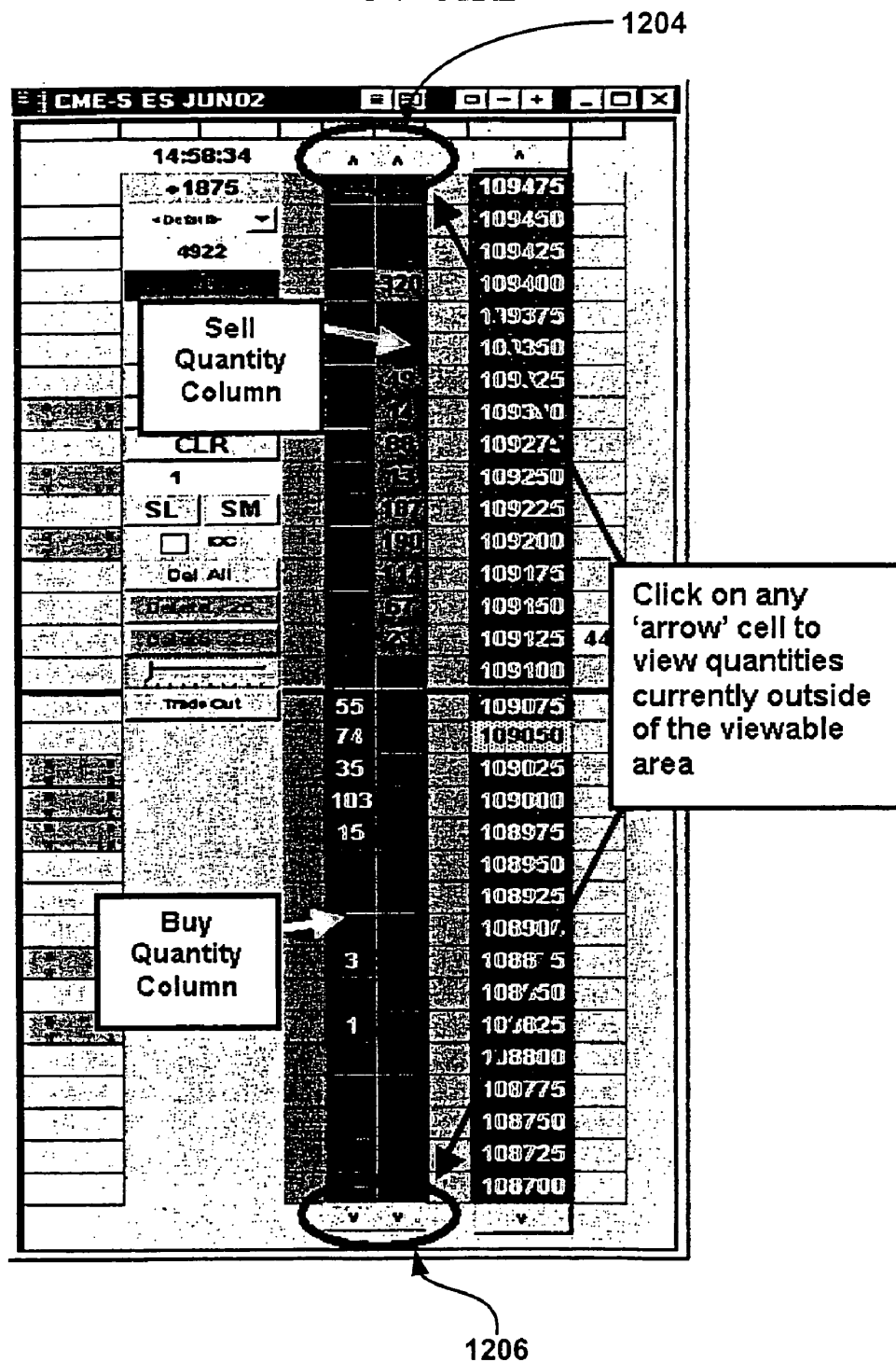
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FIG. 12B

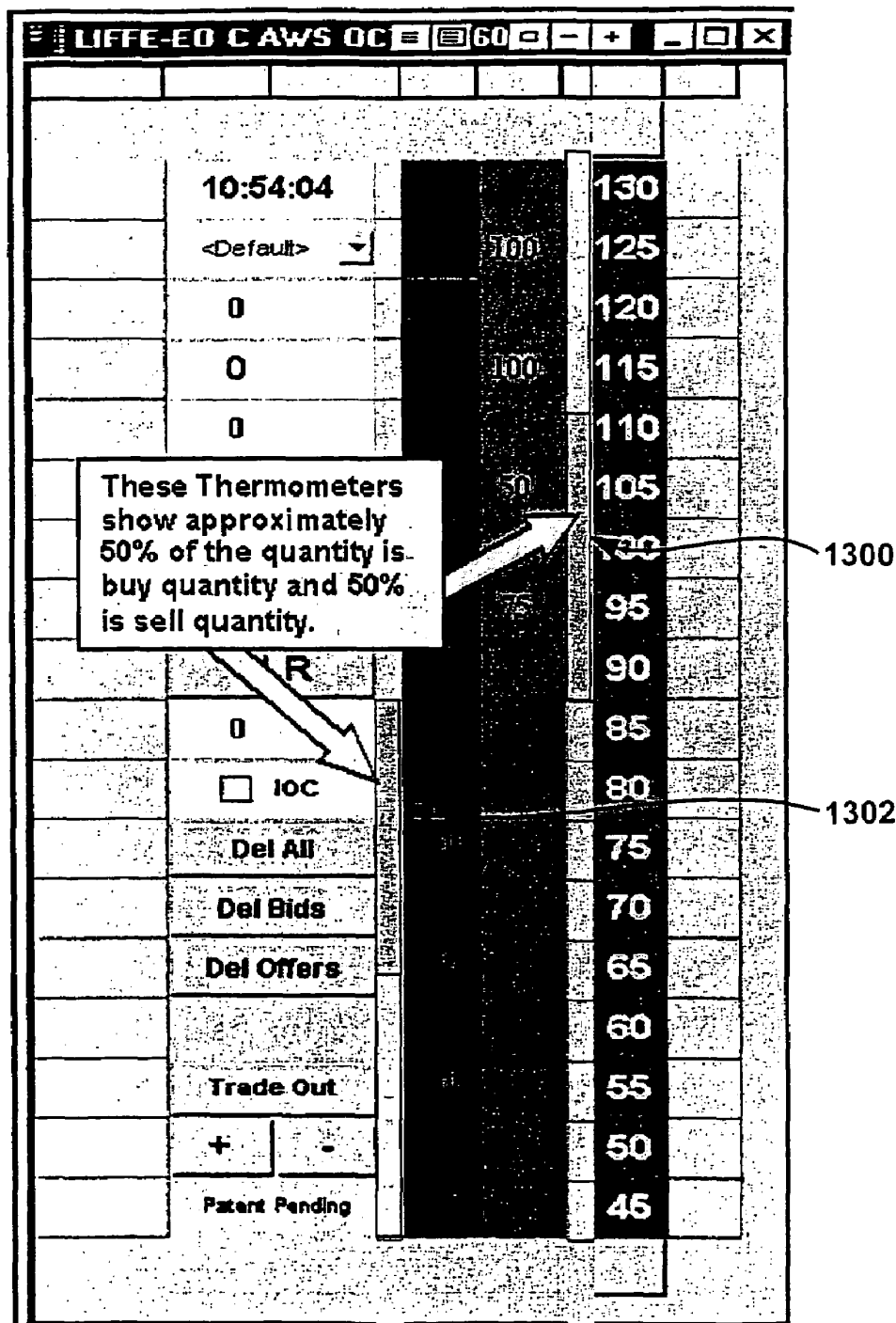


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FIG. 13A

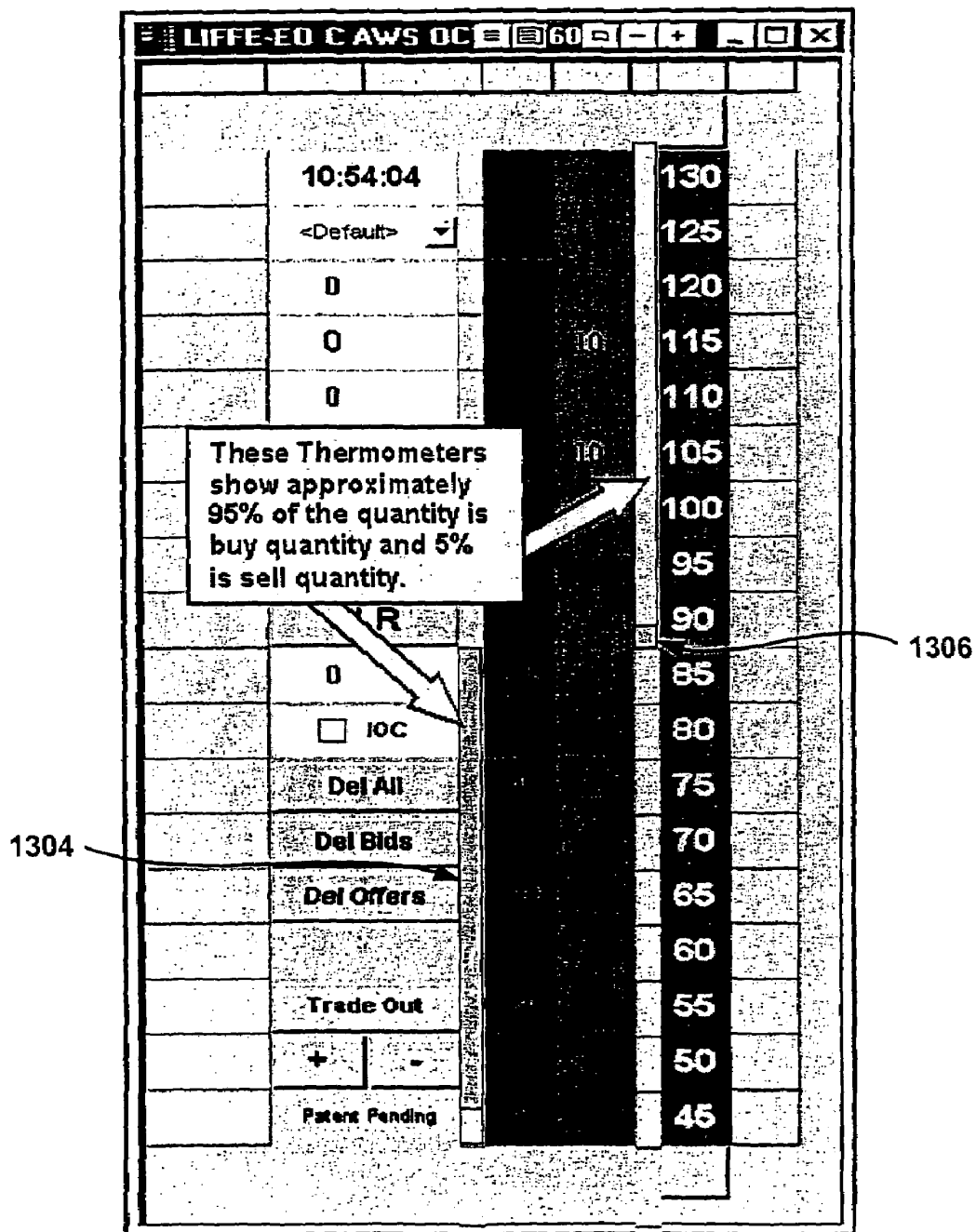
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FIG. 13B



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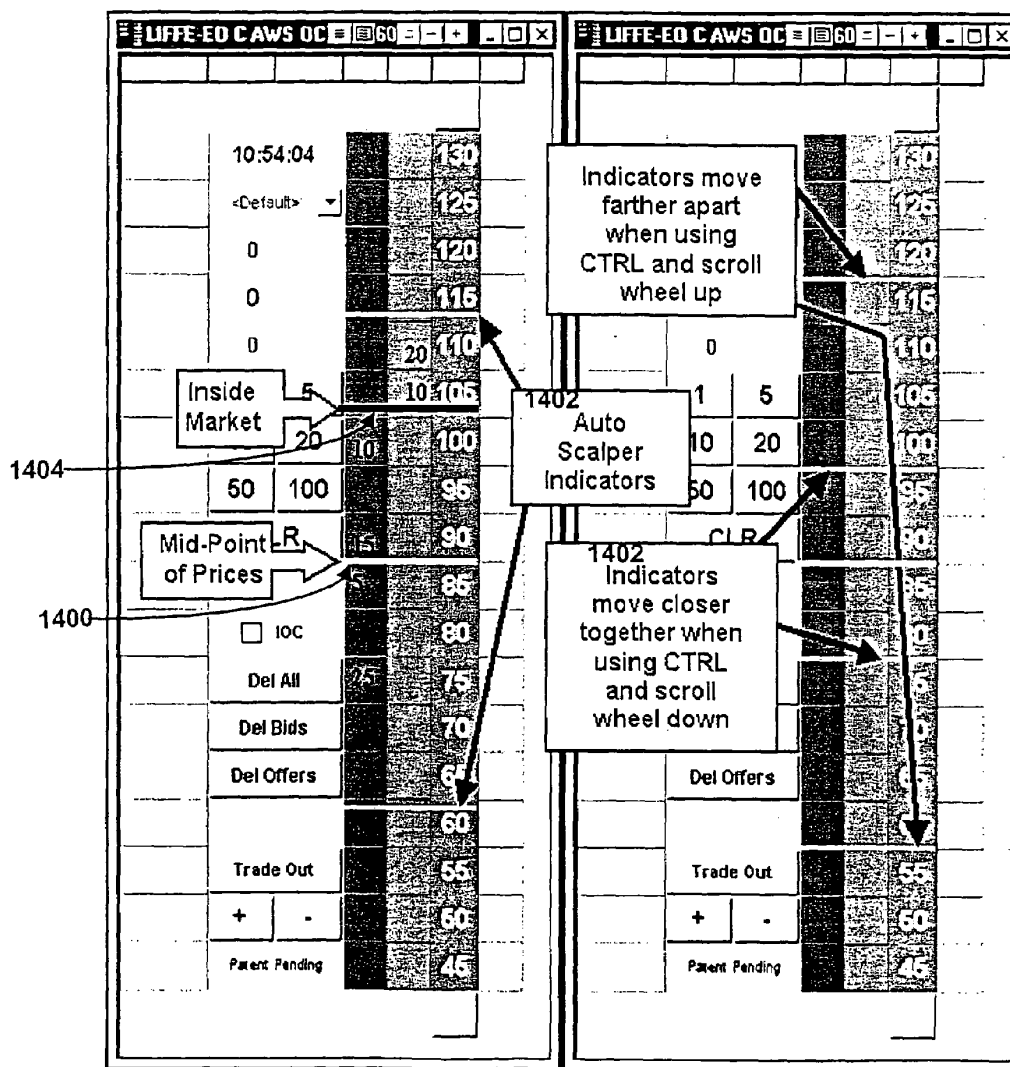
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FIG. 14A

FIG. 14B



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FIG. 15A

MD Trader Options for LIFFE-E AOL DEC01

GUI Options

- ☒ Show Tooltips
- ☒ Show Clock
- ☒ Show Customer Account Combobox
- ☐ Show IOC Checkbox
- ☐ Show Delete All Button
- ☒ Show TradeOut Button
- ☐ Show Bid Indicator Column
- ☐ Show Ask Indicator Column
- ☒ Color Code Blank Spots
- ☐ Keep MD Trader on Top
- ☐ Do "Delete All" when LTQ Column Clicked
- ☐ Do Sweep
- ☒ Left Button
- ☐ Allow only
- ☐ Use Inside
- ☐ Enable Ke
- ☒ Highlight
- ☒ Enable Average Price
- ☒ Enable Drag/Drop of Working Orders
- ☒ Show Bold Text on Bid/Ask Column
- ☒ Price Reasonability Check

Format

digits for Working/Exec.

digits for Price Display

Price Consolidation

Prices per line Offset

☐ Show Slider Control Increment(Ticks)

Order Parameters

Maximum Order Quantity

TradeOut Method

☐ Using LIMIT Order # of ticks to skew

☐ Using MARKET Order

☐ Enable Automatic Grid Centering

- ☒ Every seconds
- ☒ Last Traded Price Within rows from top/bottom
- ☒ Inside Market Within rows from top/bottom
- ☐ Enable Grid Recenter warning

Stop Orders

☒ Enable Stop Market Orders

☒ Enable Stop Limit Orders

Set Stop limit price ticks from stop entry price

☒ Display Delete Buttons/Working Quantity Totals

- ☒ Display Working Buys/Sells - Text Only
- ☐ Delete Total Working Buys/Sells - Quantity on Button
- ☐ Delete Bids/Offers - Button Only
- ☐ Display Working Buys/Sells as Text and Delete Bids/Offers as buttons

Check Box to Enable Price Level Reasonability Check

1500

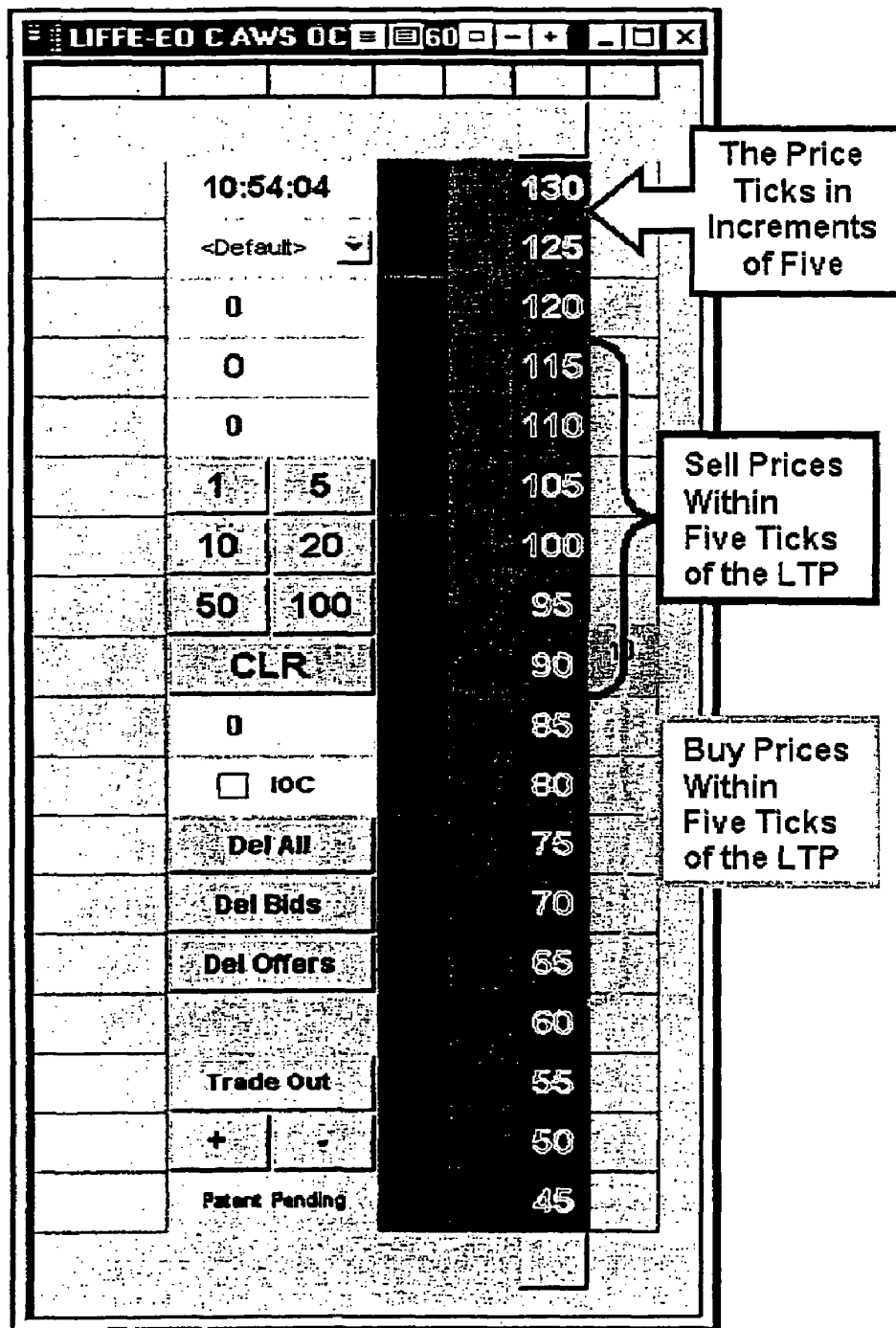
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FIG. 15B

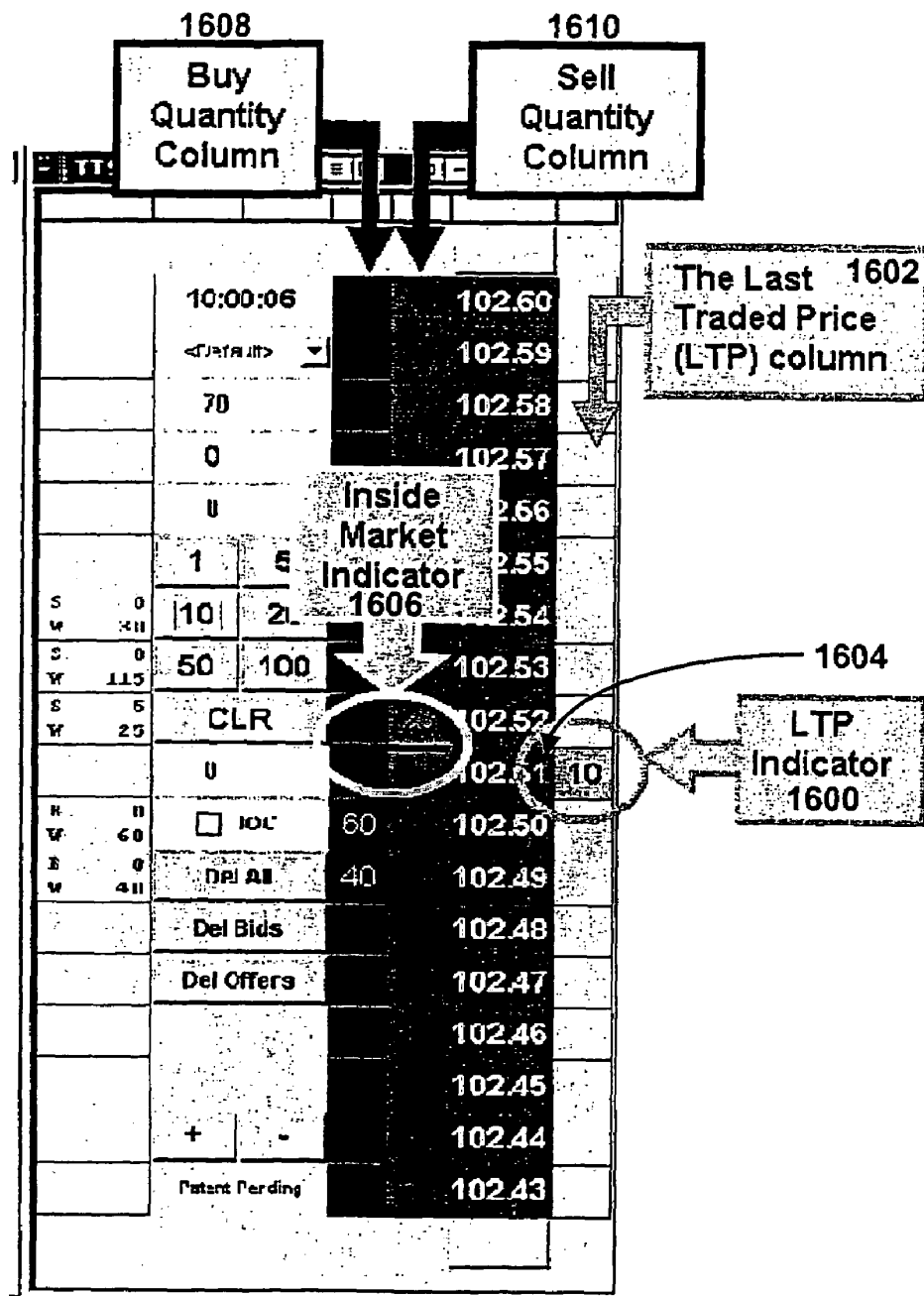
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FIG. 16A



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FIG. 16B

MD Trader Options for LIFFE-E AOL DEC01

GUI Options

- ☒ Show Tooltips
- ☒ Show Click
- ☒ Show Customer Account Combobox
- ☐ Show IOC Checkbox
- ☐ Show Delete All Button
- ☒ Show TradeOut Button
- ☐ Show Bid Indicator Column
- ☐ Show Ask Indicator Column
- ☒ Color Code Blank Spots
- ☐ Keep MD Trader on Top
- ☐ Do "Delete All" when LTQ Column Clicked
- ☐ Do Sweep on Right Click
- ☒ Left Button actions on Mouse DOWN
- ☐ Allow only one order per side of market
- ☐ Use Inside Market Prices
- ☐ Enable Keyboard and Function Key Trading
- ☒ Highlight Midpoint of Last Recenter
- ☒ Enable Average Price
- ☒ Enable Drag/Drop of Working Orders
- ☒ Show Bold Text on Bid/Ask Column
- ☒ Price Reasonability Check - 5

Format

digits for Working/Exec.

digits for Price Display

Price O

Sh

Order P

TradeOut Method

☐ Using LIMIT Order # of ticks to skew

☒ Using MARKET Order

☐ Enable Automatic Grid Centering

☒ Every seconds

☐ Last Traded Price Width rows from top/bottom

☐ Inside Market Width rows from top/bottom

☐ Enable Grid Recenter warning

Stop Orders

☒ Enable Stop Market Orders

☒ Enable Stop Limit Orders

Set Stop limit price ticks from stop entry price

☒ Display Delete Buttons/Working Quantity Totals

☒ Display Working Buys/Sells - Text Only

☐ Delete Total Working Buys/Sells - Quantity on Button

☐ Delete Bids/Offers - Button Only

☐ Display Working Buys/Sells as Text and Delete Bids/Offers as buttons

Check Box to Enable Track Market / Automatic Grid Centering Feature

OK Cancel

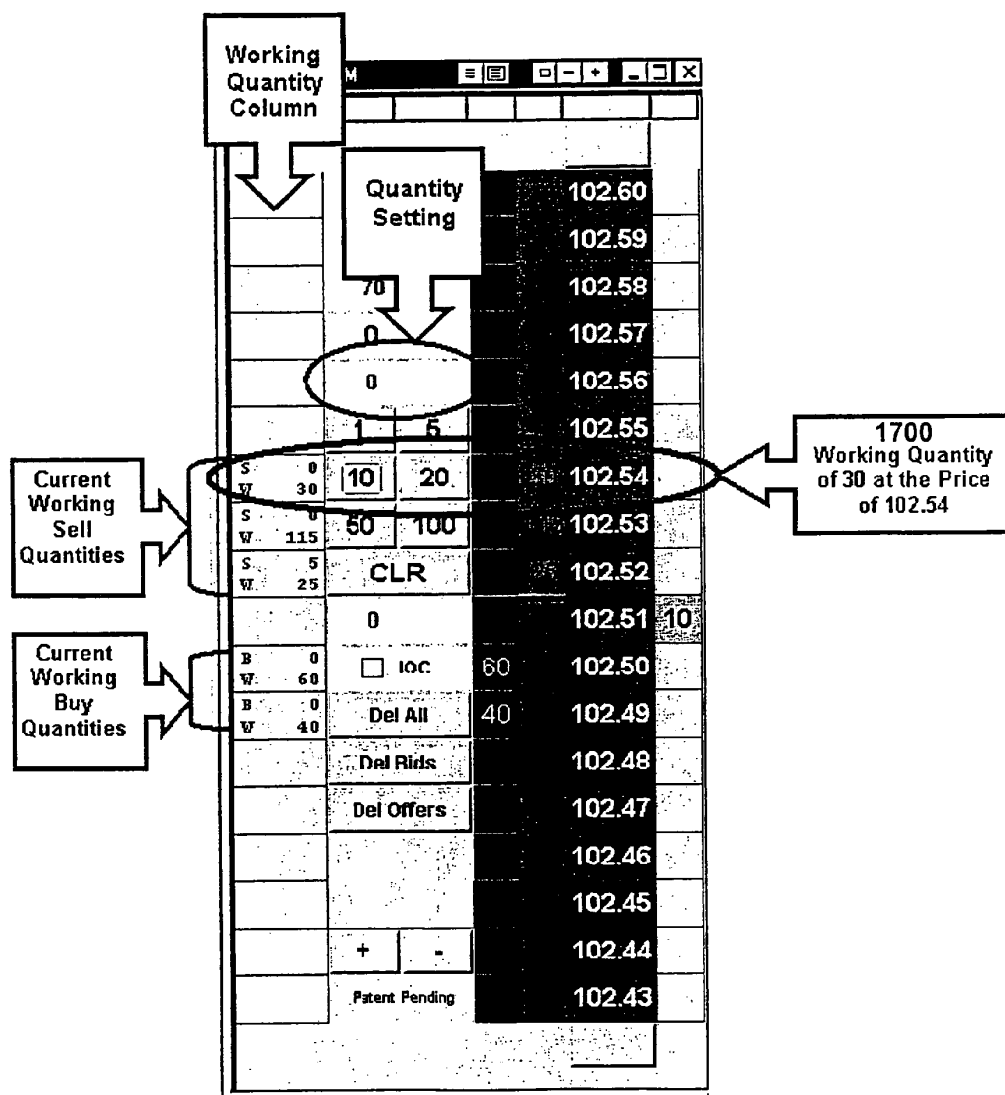
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FIG. 17

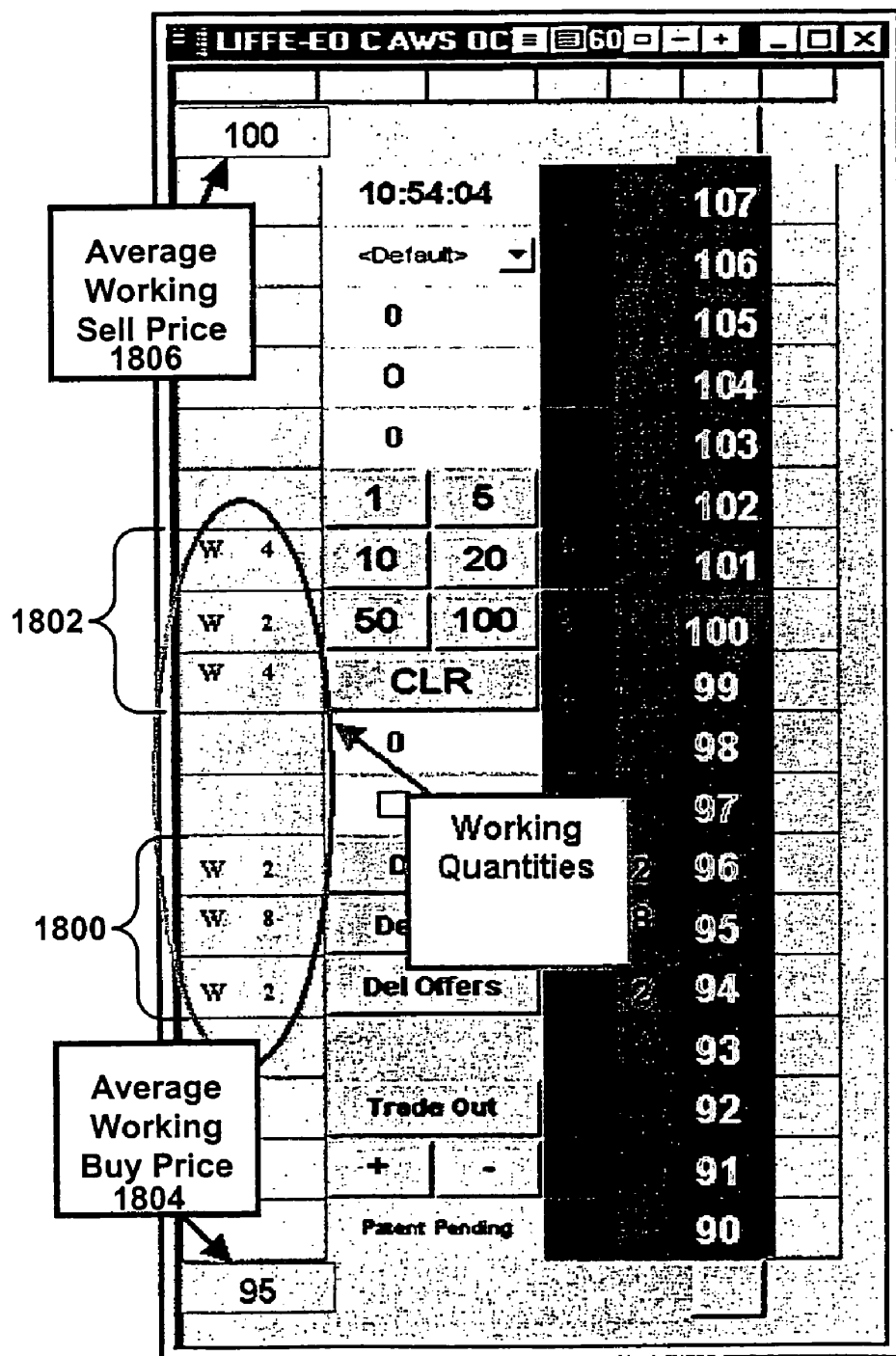


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FIG. 18

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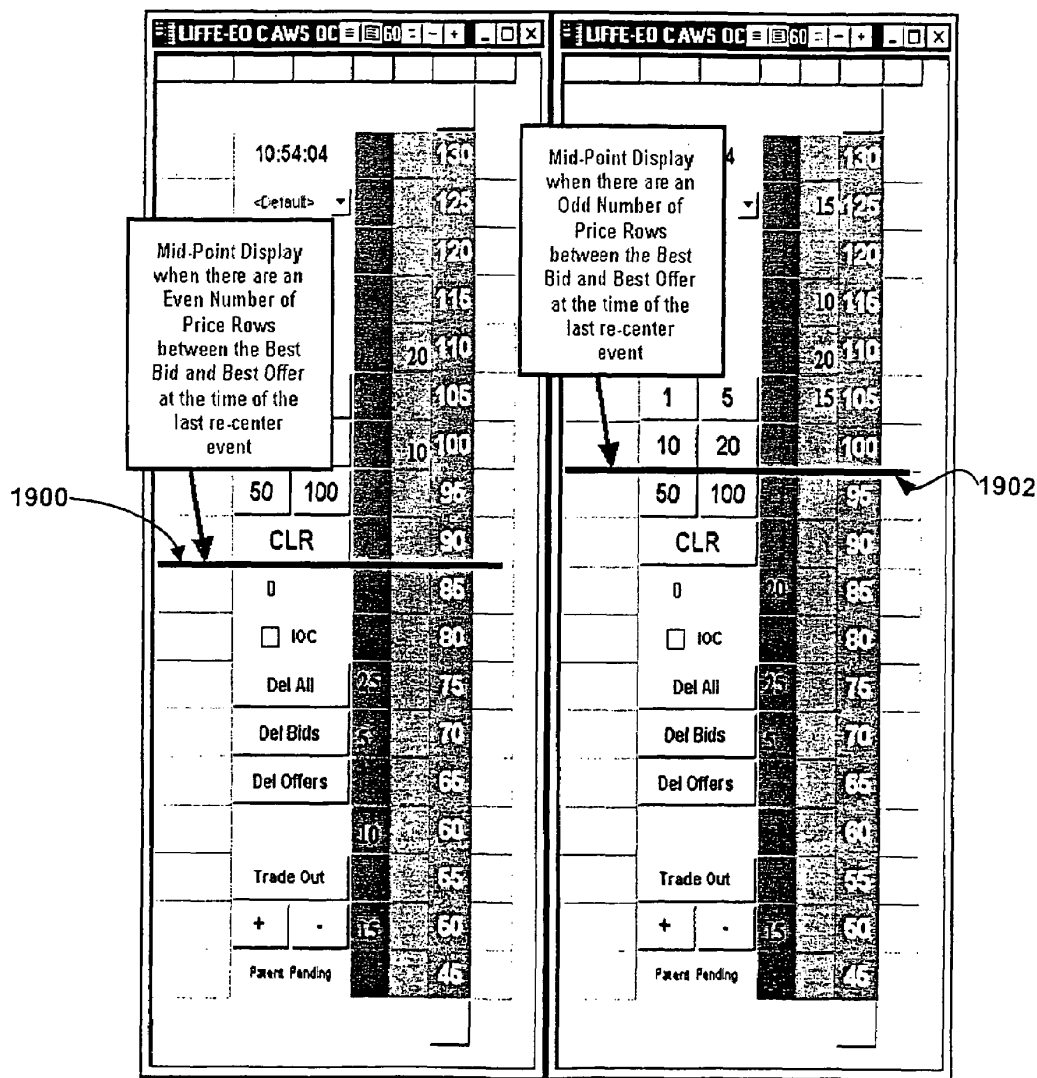
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FIG. 19A

FIG. 19B



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FIG. 19C

MD Trader Options for LIFFE-E AOL DEC01

GUI Options

- ☒ Show Tooltips
- ☒ Show Clock
- ☒ Show Customer Account Combobox
- ☐ Show IOC Checkbox
- ☐ Show Delete All Button
- ☒ Show TradeOut Button
- ☐ Show Bid Indicator Column
- ☐ Show Ask Indicator Column
- ☒ Color Code Blank Spots
- ☐ Keep MD Trader on Top
- ☐ Do "Delete All" when LTQ Column Clicked
- ☐ Do Sweep on Right Click
- ☒ Left Button actions on Mouse DOWN
- ☐ Allow only one order per side of market
- ☐ Use Inside Market Prices
- ☐ Enable Keyboard and Function Key Trading
- ☒ **Highlight Midpoint of Last Recenter**
- ☒ Enable Average Price
- ☒ Enable Drag/Drop of Working Orders
- ☒ Show Bold Text on Bid/Ask Column
- ☒ Set row height: 30

Format

5 # digits for Working/Exec.
11 # digits for Price Display

Price Consolidation

7 # Prices per line 5 Offset
☐ Show Slider Control Increment(Ticks) 5

Order Parameters

10000 Maximum Order Quantity

TradeOut Method

of ticks to skew

Check Box to Enable 'Highlight Midpoint of Last Recenter' Feature

entering
side
n 2 rows from top/bottom
n 2 rows from top/bottom

☐ Inside Market Warning
☐ Enable Grid Recenter warning

Stop Orders

- ☒ Enable Stop Market Orders
- ☒ Enable Stop Limit Orders
- Set Stop limit price 5 ticks from stop entry price

☒ Display Delete Buttons/Working Quantity Totals

- ☒ Display Working Buys/Sells - Text Only
- ☐ Delete Total Working Buys/Sells - Quantity on Button
- ☐ Delete Bids/Offers - Button Only
- ☐ Display Working Buys/Sells as Text and Delete Bids/Offers as buttons

1906 →

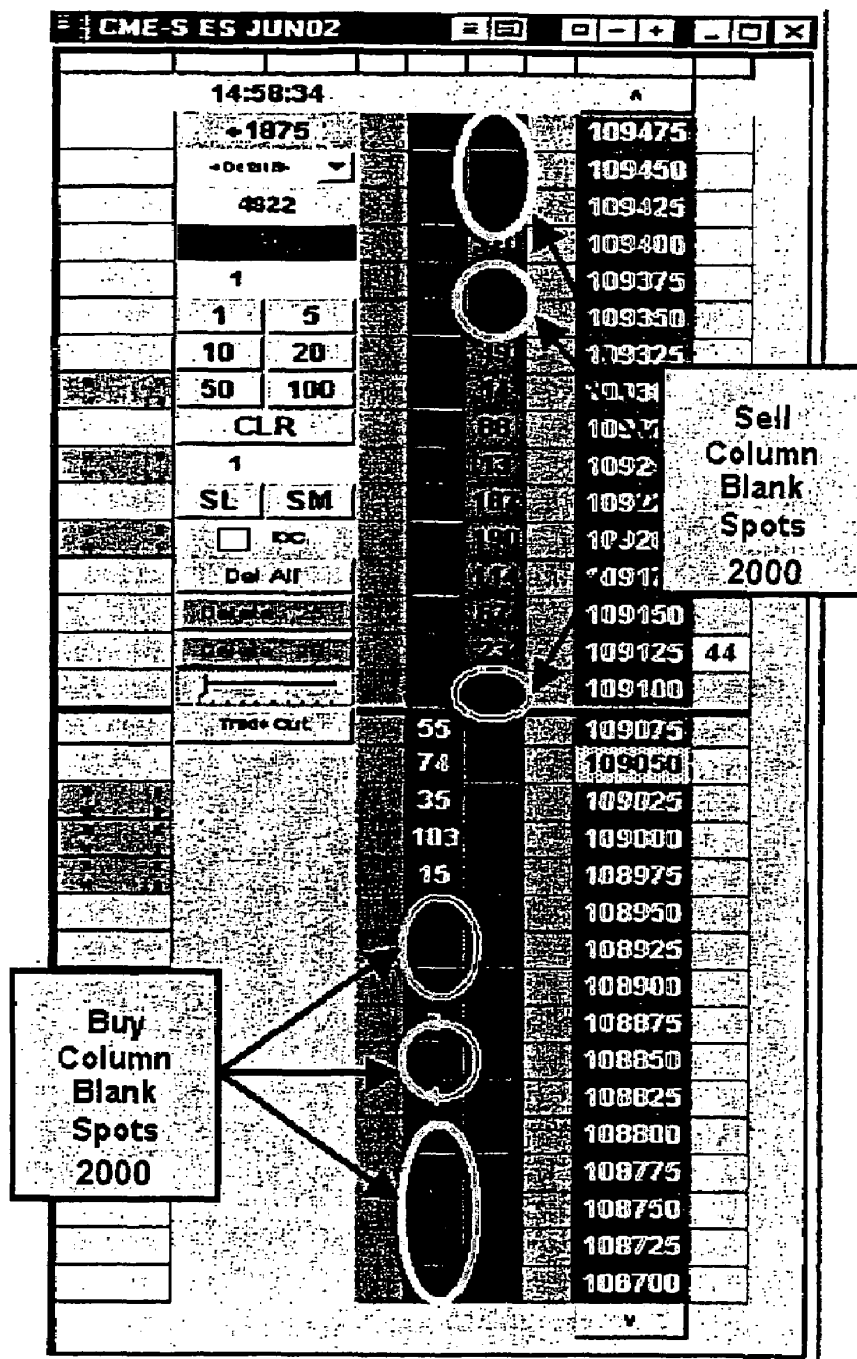
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FIG. 20A



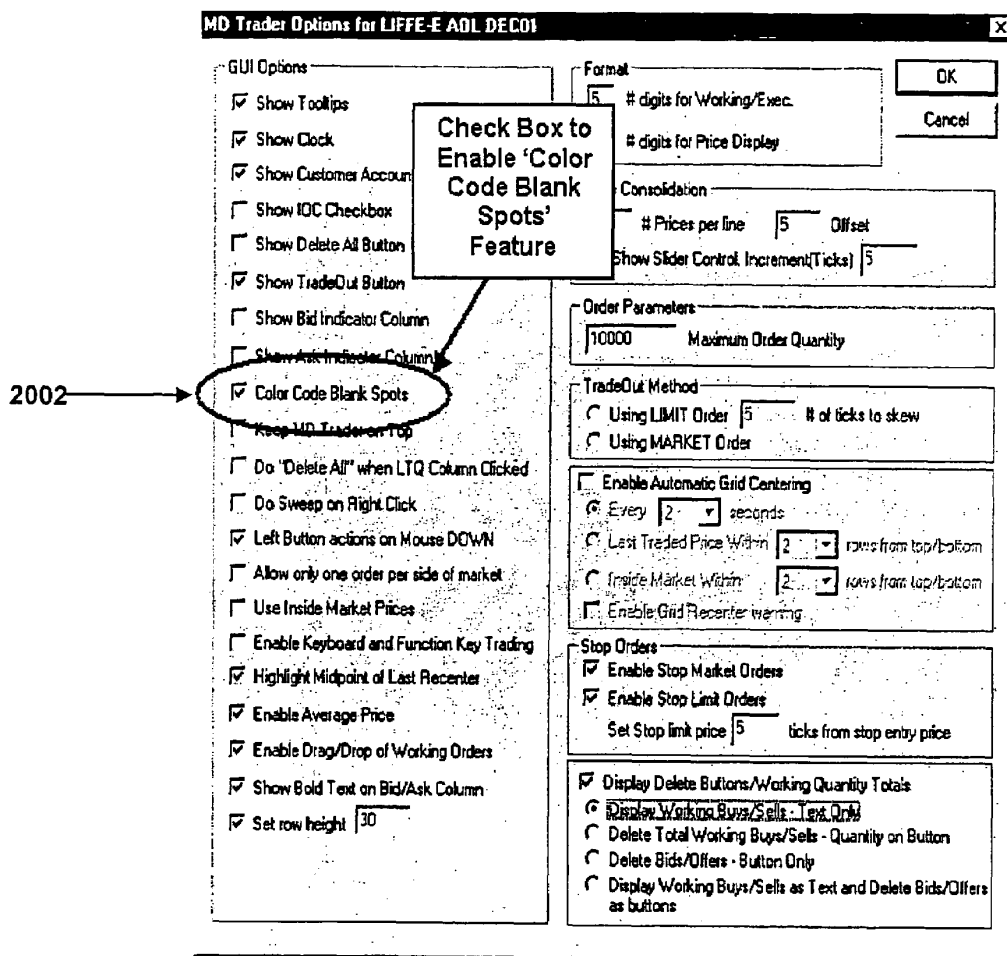
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FIG. 20B

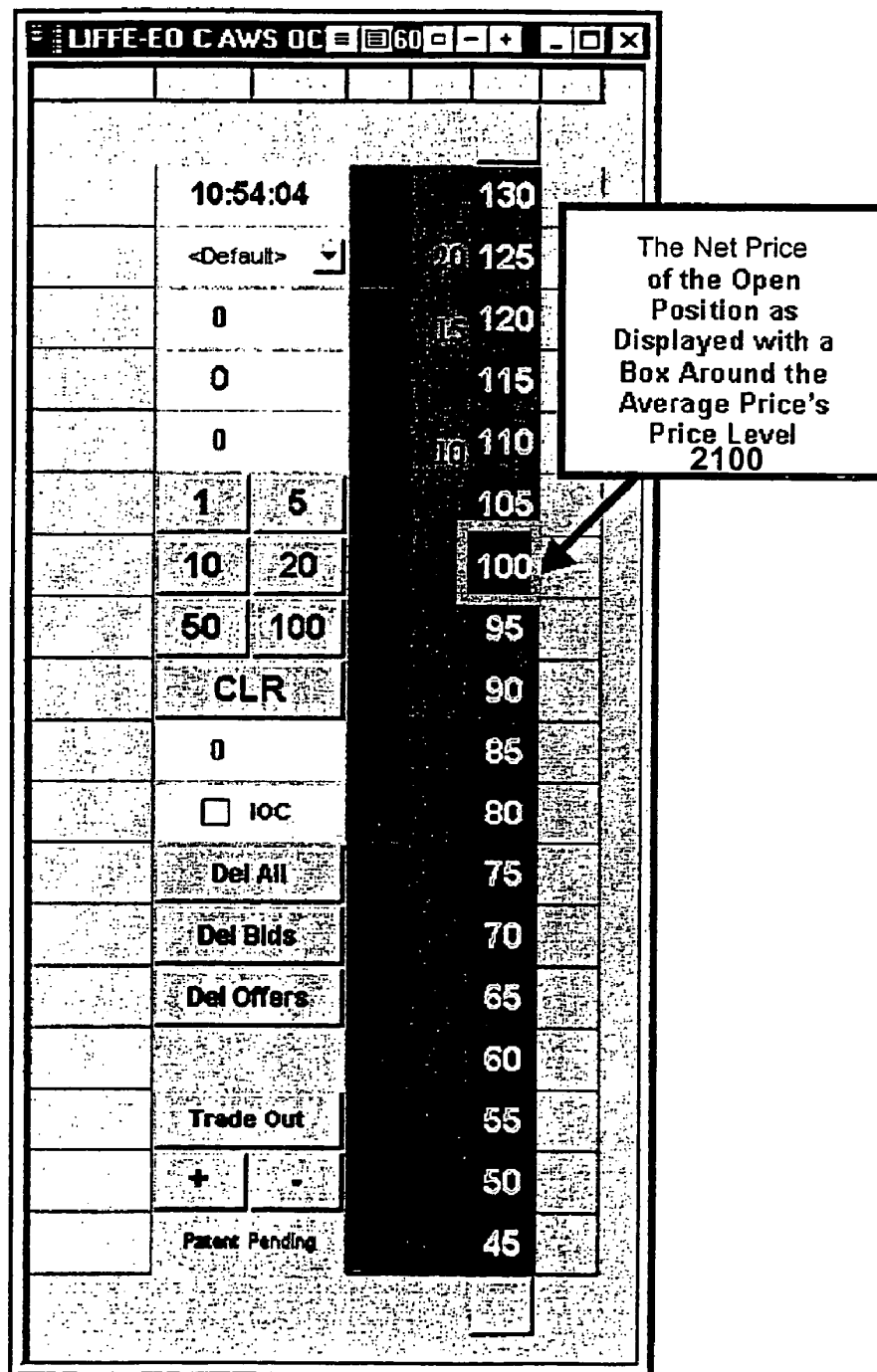


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FIG. 21

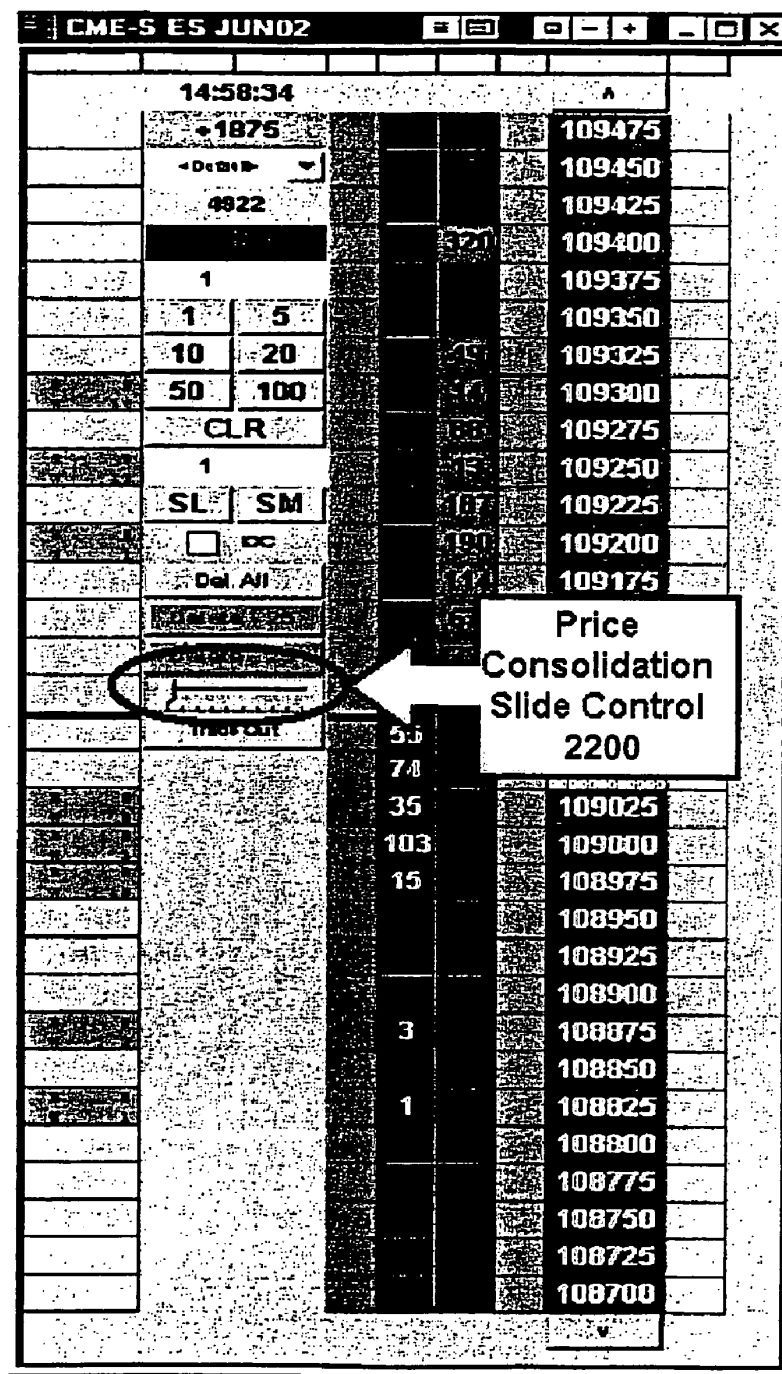
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FIG. 22



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SYSTEM AND METHOD FOR AUTOMATIC REPOSITIONING OF MARKET INFORMATION IN A GRAPHICAL USER INTERFACE

This application is a continuation of U.S. patent application Ser. No. 10/403,881, filed Mar. 31, 2003, which is a continuation of U.S. patent application Ser. No. 10/125,894, "Trading Tools for Electronic Trading," filed Apr. 19, 2002 now U.S. Pat No. 7,389,268, which is a continuation-in-part of U.S. patent application No. Ser. 09/971,087, filed Oct. 5, 2001 now U.S. Pat No. 7,127,424, which claims the benefit of U.S. Provisional Application No. 60/238,001, filed Oct. 6, 2000. U.S. patent application Ser. No. 10/125,894 is also a continuation-in-part of U.S. patent application Ser. No. 09/590,692, filed Jun. 9, 2000 now U.S. Pat No. 6,772,132 and U.S. patent application Ser. No. 09/589,751, filed Jun. 9, 2000 now U.S. Pat No. 6,938,011, both of which claim the benefit of U.S. Provisional Application No. 60/186,322, filed Mar. 2, 2000. U.S. patent application Ser. No. 10/125,894 also claims the benefit of U.S. patent application Ser. No. 60/325,553, filed Oct. 1, 2001. The entire content of each of the above-referenced applications is incorporated herein by reference.

FIELD OF INVENTION

The present invention is directed to electronic trading. Specifically, the present invention is directed to tools for trading products that can be traded with quantities and/or prices.

BACKGROUND

Many exchanges throughout the world utilize electronic trading in varying degrees to trade stocks, bonds, futures, options and other products. These electronic exchanges are based on three components: mainframe computers (host), communications servers, and the exchange participants' computers (client). The host forms the electronic heart of the fully computerized electronic trading system. The system's operations cover order-matching, maintaining order books and positions, price information, and managing and updating the database for the online trading day as well as nightly batch runs. The host is also equipped with external interfaces that maintain uninterrupted online contact to quote vendors and other price information systems.

Traders can link to the host through at least three types of structures: high speed data lines, high speed communications servers or the Internet. High speed data lines establish direct connections between the client and the host. Another connection can be established by configuring high speed networks or communications servers at strategic access points worldwide in locations where traders physically are located. Data is transmitted in both directions between traders and exchanges via dedicated high speed communication lines. Most exchange participants install two lines between the exchange and the client site or between the communication server and the client site as a safety measure against potential failures. An exchange's internal computer system is also often installed with backups as a redundant measure to secure system availability. The third connection utilizes the Internet. Here, the exchange and the traders communicate back and forth through high speed data lines, which are connected to the Internet. This allows traders to be located anywhere they can establish a connection to the Internet.

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Irrespective of the way in which a connection is established, the exchange participants' computers allow traders to participate in the market. They use software that creates specialized interactive trading screens on the traders' desktops.

The trading screens enable traders to enter and execute orders, obtain market quotes, and monitor positions. The range and quality of features available to traders on their screens varies according to the specific software application being run. The installation of open interfaces in the development of an exchange's electronic strategy means users can choose, depending on their trading style and internal requirements, the means by which they will access the exchange.

The world's stock, bond, futures, options and other exchanges have volatile products with prices that move rapidly. To profit in these markets, traders must be able to react quickly. A skilled trader with the quickest software, the fastest communications, and the most sophisticated analysis can significantly improve the trader's own or the trader's firm's bottom line. The slightest speed advantage can generate significant returns in a fast moving market. In today's securities markets, a trader lacking a technologically advanced interface is at a severe competitive disadvantage.

Irrespective of what interface a trader uses to enter orders in the market, each market supplies to and requires from every trader the same information. The bids and asks in the market make up the market data and everyone logged on to trade can receive this information if the exchange provides it. Similarly, every exchange requires that certain information be included in each order. For example, traders must supply information like the name of the commodity, quantity, restrictions, price and multiple other variables. Without all of the order information, the market will not accept the order.

In existing systems, multiple elements of an order must be entered prior to an order being sent to market, which is time consuming for the trader. Such elements include the commodity symbol, the desired price, the quantity and whether a buy or a sell order is desired. The more time a trader takes entering an order, the more likely the price on which the trader wanted to bid or offer will change or not be available in the market. The market is fluid as many traders are sending orders to the market simultaneously. In fact, successful markets strive to have such a high volume of trading that any trader who wishes to enter an order will find a match and have the order filled quickly, if not immediately. In such liquid markets, the prices of the commodities fluctuate rapidly. On a trading screen, this results in rapid changes in the price and quantity fields within the market grid. If a trader intends to enter an order at a particular price, but misses the price because the market prices moved before the trader could enter the order, the trader may lose hundreds, thousands, even millions of dollars. The faster a trader can trade, the less likely it will be that the trader will miss the trader's price and the more likely the trader will make money.

With the advent of electronic trading, it has become easier for a larger number of people to have access to participate in the market at any given time. Such an increase in the number of potential traders has lead to other changes, including a more competitive market, greater liquidity, rapidly changing prices, and other changes. Due to the complexities that these changes bring, it is increasingly important to have a system of making the most accurate and calculated trades possible in the most efficient manner. It is therefore desirable for electronic trading systems to offer tools that can assist a trader in adapting to an electronic marketplace, and help the trader to make trades at desirable prices.

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SUMMARY

The preferred embodiments relate to a system and method for automatic repositioning of market information in a graphical user interface.

In accordance with a first aspect, a method for automatically positioning information related to a commodity on a graphical user interface is provided. The method includes receiving market information relating to the commodity from an electronic exchange. The market information may include a number of items of interest that are associated with a price. The method displays an information display region, which has a number of locations arranged such that each location corresponds to a price level along at least a portion of a static price axis. The method also displays a number of indicators, at a first time. Each indicator is associated with an item of interest and each indicator is displayed in one of the locations in the information display region. The method further includes automatically repositioning the static price axis upon detecting a predetermined condition so that the number of locations of the information display region corresponds to a different portion of the static price axis at a second time. In this manner, the indicators are moved to a new location in the information display region that corresponds to the price level on the static price axis that is associated with that indicator.

In accordance with a second aspect, a method for automatically re-positioning market information relating to a commodity on a graphical user interface is provided, where the method includes displaying a plurality of items of interest comprising market information in relation to a static scale in a trading interface. At least one item of interest from the plurality of items of interest is identified as a basis for automatically positioning the plurality of items of interest. The display on the trading interface is updated as the market information changes, causing one or more of the plurality of items of interest to move in relation to the static scale. The method then automatically re-positions the plurality of items of interest in response to the identified item of interest.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates the network connections between multiple exchanges and client sites;

FIG. 2 illustrates screen display showing the inside market and the market depth of a given commodity being traded;

FIG. 3 illustrates an alternative display, having bid and ask quantities displayed in association with a static price scale, that may be used in accordance with preferred embodiments;

FIG. 4 illustrates the display at a later time showing the movement of values when compared to FIG. 3;

FIG. 5 illustrates a display with parameters set in order to exemplify the trading method;

FIG. 6 is a flowchart illustrating one process for display and trading using the displays of FIGS. 3 through 5;

FIG. 7 illustrates a Last Traded Quantity marker in accordance with a preferred embodiment, and further illustrates color coding of the Last Traded Quantity;

FIG. 8 is a diagram showing the transfer of multiple data feeds between an exchange and a client;

FIG. 9 is a diagram showing a disruption in one of the data feeds shown in FIG. 8;

FIG. 10 illustrates a display showing the aggregated working quantities in a market for a user's buy and sell orders;

FIGS. 11A and 11B are displays showing a dynamic indicator;

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FIGS. 12A and 12B are displays showing "arrow" cells that may be used to view items of interest outside the current display;

FIGS. 13A and 13B are displays showing examples of thermometer indicators to illustrate the quantity of buy and sell interest in a market;

FIGS. 14A and 14B are displays illustrating auto scalper indicators;

FIGS. 15A and 15B are a display showing an embodiment in which a user may select the price level reasonability check feature through a dialog box, and a display showing a measure of reasonability in relation to the Last Traded Price, respectively;

FIG. 16A is a display showing the display of the last traded price and inside market for use with the automatic grid centering feature of a preferred embodiment; and FIG. 16B is a display showing how a user may select and manipulate the automatic grid positioning feature;

FIG. 17 is a display showing a user's current working sell quantities and working buy quantities and additional criteria used for implementing the "drag and drop" feature of a preferred embodiment;

FIG. 18 is a display showing the working quantities of a user in addition to the user's average working buy price and average working sell price;

FIGS. 19A and 19B are displays showing the function of the highlight midpoint re-centering feature of a preferred embodiment; FIG. 19C is a sample GUI options dialog box in which the highlight midpoint re-centering feature can be activated according to one embodiment of the present invention;

FIG. 20A is a display showing how blank spots are color-coded according to one embodiment; FIG. 20B is a display of a sample GUI options dialog box in which a user can activate the color coding feature of FIG. 20A;

FIG. 21 is a display showing how the average price of a trader's open position is indicated according to one embodiment of the invention; and

FIG. 22 is a display showing one embodiment of a consolidation control icon in accordance with a preferred embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As described with reference to the accompanying figures, trading tools in accordance with various preferred embodiments are provided to, among other things, facilitate fast and accurate order entry. Certain of the trading tools work particularly well with a trading display that shows working orders and/or bid and ask quantities, or other market information, displayed in association with a static price scale or axis. An example of such a trading display is illustrated in FIGS. 3 through 5. It is to be understood that, in this context, static does not mean immovable, but rather means fixed in relation. For example, with a static price scale, the scale itself may be movable, but the prices represented remain fixed in relation to each other, subject to consolidation or expansion as described below. Trading applications that generate different trading displays may alternatively be used.

In a preferred embodiment, one or more of the trading tools described herein is implemented on a computer or electronic terminal. The computer is able to communicate either directly or indirectly (using intermediate devices) with one or more exchanges to receive and transmit market, commodity, and trading order information. The computer or terminal is able to interact with the trader and to generate contents and characteristics of a trade order to be sent to the exchange. A trading

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application allows for a trader to view market data, enter and cancel trade orders and/or view orders. The scope of the present invention is not limited by the type of terminal or device used, and is not limited to any particular type of trading application. Rather, the trading tools may be implemented on any existing or future terminal or device with the processing capability to perform the functions described herein.

As used herein, the word “commodity” refers simply to a thing that is an object of trade. It includes anything that can be traded with a quantity and/or price. Examples of such objects include, but are not limited to, all types of traded financial products, such as, for example, stocks, options, bonds, futures, currency, and warrants, as well as funds, derivatives and collections or combinations of the foregoing. The commodity may be “real,” such as objects that are listed by an exchange for trading, or “synthetic,” such as a combination of real commodities that is created by the user.

Further, the specification may refer to a single click of a mouse as an example of a single action of the user for input and interaction with the terminal display. In order to allow actions to be taken in the shortest amount of time, a preferred embodiment of the trading application responds upon depressing the mouse button, rather than waiting for the up click. While this may describe a preferred mode of interaction, the scope of the present invention is not limited to the use of a mouse as the input device or to the click of a mouse button as the user’s single action. Rather, any action by a user, whether comprising one or more clicks of a mouse button or other input device, such as a keyboard, joystick or touch screen, may be considered the single action of the user.

An electronic trading system may be configured to allow for trading in a single or in multiple exchanges simultaneously. Connections for an example of such a system are illustrated in FIG. 1. This illustration shows multiple host exchanges 101-103 connected through routers 104-106 to gateways 107-109. Multiple client terminals 110-116 for use as trading stations can then trade in the multiple exchanges through their connection to the gateways 107-109. It should be noted that the trading tools of the preferred embodiment are not limited to any particular network architecture, but rather may be applied with utility on workstations or other client devices in any network that can be used for electronic trading.

When an electronic trading system is configured to receive data from multiple exchanges, it is preferable to translate the data from each exchange into a format that may be displayed using a graphical user interface. For the example shown in FIG. 1, an application program interface (“TT API” as depicted in the FIG. 1) translates the incoming data formats from the different exchanges to a common data format. This translation function of a preferred embodiment may be disposed anywhere in the network, for example, at the gateway server, at the individual workstations or at both. In addition, storage elements at the gateway servers, the client workstations, and/or other external storage may cache, buffer, or store historical data, such as order books that list the user’s active orders in the market; that is, those orders that have neither been filled nor cancelled. Information from different exchanges can be displayed in one or in multiple windows at the client workstation. Accordingly, while reference is made through the remainder of the specification to a single exchange to which a trading terminal is connected, the scope of the invention includes the ability to trade, in accordance with the trading methods described herein, in multiple exchanges using a single trading terminal.

A commercially available trading application that allows a user to trade in a system like that shown in FIG. 1 is

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X_TRADER® from Trading Technologies International, Inc. of Chicago, Ill. X_TRADER® also provides an electronic trading interface, referred to as MD_TRADER™, in which working orders and/or bid and ask quantities are displayed in association with a static price scale. The preferred embodiments, however, are not limited to any particular product that performs the translation, storage and/or display functions.

Several preferred embodiments include the display of “market depth” and/or allow a user to view the market depth of a commodity and to enter orders with a single input, such as the click of a computer mouse button. As used herein, market depth is represented by the available order book, including the current bid and ask quantities and their associated prices. In other words, subject to the limits noted below, market depth is each available pending bid and ask quantity, entered at a particular price, in addition to the “inside market.” For a commodity being traded, the inside market is the highest bid price and the lowest ask price. For embodiments relating to a display that includes market depth, interfaces as shown in FIGS. 2 and 3 are exemplary. Other trading applications that are capable of displaying market depth are suitable alternatives, unless otherwise noted. Furthermore, the preferred embodiments are not limited to an electronic trading application that displays market depth, but can be utilized with any electronic trading application.

Generally, the exchanges send price, order and fill information to the gateways 107-109. The trading application, for example X_TRADER®, processes this information and maps it to positions in a theoretical grid program or any other comparable mapping technique for mapping data to a screen. The physical mapping of such information to a screen grid, for display on a client device like the client devices 110-116, may be done by any technique known to those skilled in the art. The present invention is not limited by the method used to map the data to the screen display.

The system’s ability to fully display the market depth typically depends on how much of the market depth the exchange provides. Some exchanges, for example, supply an infinite market depth, while others provide no market depth or only a few orders away from the inside market. The user can preferably also choose how far into the market depth to display on the trader’s screen. For example, the user may only want to have displayed the market depth within a predetermined number of ticks away from the inside market.

FIG. 2 illustrates an electronic trading interface described in a co-pending U.S. patent application Ser. No. 09/589,751, incorporated above. This display and system is just one example of a type of trading system that may incorporate one or more aspects of the present invention. The display shows the inside market and the market depth of a given commodity being traded. Row 1 represents the “inside market” for the commodity being traded which is the best (highest) bid price and quantity and the best (lowest) ask price and quantity. Rows 2-5 represent the “market depth” for the commodity being traded. In one preferred embodiment, the display of market depth (rows 2-5) lists the available next-best bids, in column 203, and asks, in column 204. The working bid and ask quantity for each price level is also displayed in columns 202 and 205 respectively (inside market—row 1). Prices and quantities for the inside market and market depth update dynamically on a real time basis as such information is relayed from the market.

In the screen display shown in FIG. 2, the commodity (contract) being traded is represented in row 1 by the character string “CDH0”. The Depth column 201 will inform the trader of a status by displaying different colors. Yellow indicates that the program application is waiting for data. Red

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indicates that the Market Depth has failed to receive the data from the server and has “timed out.” Green indicates that the data has just been updated. The other column headings in this and all of the other figures, are defined as follows. BidQty (Bid Quantity) at column **202**: the quantity for each working bid; BidPrc (Bid Price) at column **203**: the price for each working bid; AskPrc (Ask Price) at column **204**: the price for each working ask; AskQty (Ask Quantity) at column **205**: the quantity for each working ask; LastPrc (Last Price) at column **206**: the price for the last bid and ask that were matched in the market; and LastQty (Last Quantity) at column **207**: the quantity traded at the last price. Total at column **208** represents the total quantity traded of the given commodity.

The configuration of the screen display itself informs the user in a more convenient and efficient manner than many existing systems. Traders gain an advantage by seeing the market depth because they can see trends in the orders in the market. The market depth display shows the trader the interest the market has in a given commodity at different price levels.

Another type of display system and related trading method which may be used in conjunction with the preferred embodiments is described in detail in U.S. application Ser. No. 09/590,692, filed on Jun. 9, 2000. This method ensures fast and accurate execution of trades by displaying information, such as market depth or working orders, in association with an axis or scale of static prices. One embodiment using this type of display system displays the market depth on a vertical plane, which fluctuates logically up or down the plane as the market prices fluctuates. The invention is not limited to any particular display—the information could be displayed on a horizontal plane, n-dimensionally or in any other fashion. This allows the trader to trade quickly and efficiently. An example of such a display is illustrated in the screen display of FIG. 3.

In a fast moving market, where varying price levels are trading (i.e. bids and offers entering the market are being matched at different prices), it is beneficial that the trader be able to quickly enter orders and quickly see and analyze market information. Displays of the type illustrated in FIG. 3 allow the trader to quickly enter orders at specific price levels by clicking next to a static price level, displayed as a static column in a preferred embodiment and to quickly and easily see information such as working orders. The static prices can be displayed in any manner, including in a row, on any angle, or n-dimensionally, without departing from the invention. It also is possible for the static price values to not be displayed, instead displaying just the market depth levels, working orders, or other information relative to one another along a scale or axis representing particular prices using particular colors or using other methods.

The display shown in FIG. 3 provides an order entry system, market grid, fill window and summary of market orders in one simple window. Such a condensed display simplifies the trading system by entering and tracking trades in an efficient manner. This system displays market depth in a logical, vertical fashion or horizontally or at some other convenient angle or configuration. A vertical field is shown in the figures and described for convenience, but the field could be horizontal or at an angle or n-dimensionally. The system further increases the speed of trading and the likelihood of entering orders at desired prices with desired quantities. In the preferred embodiment of the invention, the display is a static vertical column of prices with the bid and ask quantities displayed in vertical columns to the side of the price column and aligned with the corresponding bid and ask prices.

Bid quantities are in column **300** labeled BidQ and ask quantities are in column **302** labeled AskQ. The representa-

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tive prices for the given commodity are shown in column **304**, where the prices are static and increment in “ticks,” where a tick is the minimum change in a price value that is set by the exchange for each commodity. The prices can be displayed as ticks, as multiples of ticks or in any other fashion. In the embodiment shown in FIG. 3, the column does not list the whole prices (e.g. **95.89**), but rather, just the last two digits (e.g. **89**). Other price display conventions may alternatively be used, as long as the requisite price information is conveyed to the user. In the example shown, the inside market, cells **306**, is **18** (best bid quantity) at **89** (best price) and **20** (best ask quantity) at **90** (best ask price). In the preferred embodiment of the invention, these three columns **300**, **302**, and **304** are shown in different colors so that the trader can quickly distinguish among them.

The values in the price column are static; that is, they do not normally change positions unless a re-centering command is received (discussed in detail later). The values in the Bid and Ask columns **300** and **302**, however, are dynamic; that is, they move up and down (in the vertical example) to reflect the market depth for the given commodity. The LTQ column **308** shows the last traded quantity of the commodity. The relative position of the quantity value with respect to the Price values reflects the price at which that quantity was traded. Column **310** labeled E/W (Executed/Working) displays the current status of the trader’s orders. The status of each order is displayed in the price row where it was entered. For example, in cells **312**, the number next to S indicates the number of the trader’s ordered lots that have been sold at the price in the specific row. The number next to W indicates the number of the trader’s ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order. Blanks in this column indicate that no orders are entered or working at that price. In cells **314**, the number next to B indicates the number of the trader’s ordered lots that have been bought at the price in the specific row. The number next to W indicates the number of the trader’s ordered lots that are in the market, but have not been filled—i.e. the system is working on filling the order.

Various parameters are set and information is provided in column **316**. For example, “10:48:44” in cell **318** shows the actual time of day. The L and R fields in cell **320** indicate a quantity value, which may be added to the order quantity entered. This process is explained below with respect to trading under this system. Below the L and R fields, in cell **322**, a number appears which represents the current market volume. This is the number of lots that have been traded for the chosen commodity. Cell **324**, “X 10”, displays the Net Quantity, the current position of the trader on the chosen commodity. The number “10” represents the trader’s buys minus sells. Cell **326** is the “Current Quantity”; this field represents the quantity for the next order that the trader will send to market. This can be adjusted with right and left clicks (up and down) or by clicking the buttons which appear below the Current Quantity in cells **328**. These buttons increase the current quantity by the indicated amount; for example, “10” will increase it by 10; “1H” will increase it by 100; “1K” will increase it by 1000. Cell **330** is the Clear button; clicking this button will clear the Current Quantity field. Cell **332** is the Quantity Description; this is a pull-down menu allowing the trader to choose from three Quantity Descriptions. In one embodiment, the pull-down menu is displayed when the arrow button in the window is clicked. The window includes NetPos, Offset and a field allowing the trader to enter numbers. Placing a number in this field will set a default buy or sell quantity. Choosing “Offset” in this field will enable the L/R buttons of cell **320**. Choosing “NetPos” in this field will set the current Net Quantity (trad-

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er's net position) as the trader's quantity for his next trade. Cell 334 are +/- buttons; these buttons will alter the size of the screen—either larger (+) or smaller (–). Cell 336 is used to invoke Net 0; clicking this button will reset the Net Quantity (cell 332) to zero. Cell 338 is used to invoke Net Real; clicking this button will reset the Net Quantity (cell 322) to its actual position. It is to be understood that the preferred embodiments are not limited to a trading application that displays these particular buttons. Preferably, the buttons displayed and any parameter, such as quantity, that is set by those buttons are customizable or selectable by the user.

The inside market and market depth ascend and descend as prices in the market increase and decrease. For example, FIG. 4 shows a screen displaying the same market as that of FIG. 3, but at a later interval where the inside market, cells 400, has risen three ticks. Here, the inside market for the commodity is 43 (best bid quantity) at 92 (best bid price) and 63 (best ask quantity) at 93 (best ask price). In comparing FIGS. 3 and 4, it can be seen that the price column remained static, but the corresponding bids and asks rose up the price column.

As the market ascends or descends the price column, the inside market, working orders, last traded price and/or quantity, or any other item that may be of interest might go above or below the price column displayed on a trader's screen. Usually a trader will want to be able to see the inside market to assess future trades. The system addresses this problem with a positioning feature. With a single click at any point within the gray area, 342 in FIG. 3, below the "Net Real" button, the system will re-position the inside market on the trader's screen. As an alternative, this positioning feature may be programmed to be triggered by clicking in any area of the display. Also, when using a three-button mouse, a click of the middle mouse button, irrespective of the location of the mouse pointer, will re-position the inside market on the trader's screen. As noted above, the display alternatively may be re-positioned based on other items of interest beside the inside market.

The same information and features can be displayed and enabled in a horizontal or other fashion. Just as the market ascends and descends the vertical scale in this preferred embodiment, shown in FIGS. 3 and 4, the market will move left and right in the horizontal display. The same data and the same information gleaned from the dynamic display of the data is provided. It is envisioned that other orientations can be used to dynamically display the data and such orientations are intended to come within the scope of the present invention.

The specific features of the embodiment of a display as shown in FIGS. 3 and 4 are exemplary of one embodiment of a screen display that can be used with the present invention. The present invention is in no way limited, however, to a screen display that utilizes each of these features.

Placing Trade Orders

Next, trading commodities, and specifically, the placement of trade orders using a representative display of the type shown in FIG. 3 is described. Using the display and trading method, a trader would first designate the desired commodity and, if applicable, the default quantities. The trader can then trade by positioning an icon and indicating an action, for example with a click of the right or left mouse button. The term "click" may refer to a "half-click" or button down event for any action depending upon the user's and/or system designer's requirements or preferences.

The following equations are used by this exemplary system to generate trade orders and to determine the quantity and price to be associated with the trade order. The following abbreviations are used in these formulas: P=Price value of row clicked (in ticks), R=Value in R field, L=Value in L field,

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Q=Current Quantity, Q_a =Total of all quantities in AskQ column at an equal or better price than P, Q_b =Total of all quantities in BidQ column at an equal or better price than P, N=Current Net Position, Bo=Buy order sent to market and So=Sell order sent to market.

Any order entered using right mouse button

$$Bo = (Q_a + R)P \quad (\text{Eq. 1}) \text{ If BidQ field clicked.}$$

$$So = (Q_b + R)P \quad (\text{Eq. 2}) \text{ If AskQ field clicked.}$$

Orders entered using the left mouse button

If "Offset" mode chosen in Quantity Description field then:

$$Bo = (Q_a + L)P \quad (\text{Eq. 3}) \text{ If BidQ field clicked.}$$

$$So = (Q_b + L)P \quad (\text{Eq. 4}) \text{ If AskQ field clicked.}$$

If "number" mode chosen in Quantity Description field then:

$$Bo = QP \quad (\text{Eq. 5})$$

$$So = QP \quad (\text{Eq. 6})$$

If "NetPos" mode chosen in Quantity Description field then:

$$Bo = NP \quad (\text{Eq. 7})$$

$$So = NP \quad (\text{Eq. 8})$$

Orders also can be sent to market for quantities that vary according to the quantities available in the market; quantities preset by the trader; and which mouse button the trader clicks. Using this feature, a trader can buy or sell all of the bids or asks in the market at or better than a chosen price with one click. The trader also could add or subtract a preset quantity from the quantities outstanding in the market. If the trader clicks in a trading cell—i.e. in the BidQ or AskQ column, the trader will enter an order in the market. The parameters of the order depend on which mouse button the trader clicks and what preset values the trader set.

Using the screen display and values from FIG. 5, the placement of trade orders using the display and trading method is now described using examples. A left click on the 18 in the BidQ column 500 will send an order to market to buy 17 lots (quantity # chosen on the Quantity Description pull-down menu cell 502) of the commodity at a price of 89 (the corresponding price in the Prc column 504). Similarly, a left click on the 20 in the AskQ column 506 will send an order to market to sell 17 lots at a price of 90.

Using the right mouse button, for example, an order would be sent to market at the price that corresponds to the row clicked for the total quantity of orders in the market that equal or better the price in that row plus the quantity in the R field 508. Thus, a right click in the AskQ column 506 in the 87 price row will send a sell order to market at a price of 87 and a quantity of 150, where 150 is the sum of all the quantities 30, 97, 18 and 5. The quantities 30, 97 and 18 are all of the quantities in the market that would meet or better the trader's sell order price of 87. These quantities are displayed in the BidQ column 500 because this column represents the orders outstanding in the market to purchase the commodity at each corresponding price. The quantity 5 is the quantity pre-set in the R field 508.

Similarly, a right click in the BidQ column 500 at the same price level of 87 would send a buy limit order to market for a quantity of 5 at a price of 87. The quantity is determined in the same manner as above. In this example, though, there are no orders in the market that equal or better the chosen price—there are no quantities in the AskQ column 506 that equal or

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better this price. Therefore, the sum of the equal or better quantities is zero ("0"). The total order entered by the trader will be the value in the R field 508, which is 5.

An order entered with the left mouse button, for example, and the "Offset" option chosen in the quantity description field 502 will be calculated in the same way as above, but the quantity in the L field 510 will be added instead of the quantity in the R field 508. Thus, a left click in the BidQ column 500 in the 92 price row will send a buy order to market at a price of 92 and a quantity of 96. The quantity 96 is the sum of all the quantities 45, 28, 20 and 3, 45, 28 and 20 are all quantities in the market that would meet or better the trader's buy order price of 92. These quantities are displayed in the AskQ column 506 because this column represents the orders outstanding in the market to sell the commodity at each corresponding price. The quantity 3 is the quantity pre-set in the L field 510.

The values in the L or R fields 510, 508 may be negative numbers. This would effectively decrease the total quantity sent to market. In other words, in the example of a right click in the AskQ column 506 in the 87 price row, if the R field 508 was -5, the total quantity sent to market would be 140 (30+97+18+(-5)).

If a trader chose the "NetPos" option in the quantity description field 502, a right click, for example, would still work as explained above. A left click would, for example, enter an order with a price corresponding to the price row clicked and a quantity equal to the current Net position of the trader. The Net position of the trader is the trader's current position on the chosen commodity. In other words, if the trader has bought 10 more commodities than the trader has sold, this value would be 10. NetPos would not affect the quantity of an order sent with a right click.

If the trader chose a number value in the quantity description, a left click would send an order to market for the current quantity chosen by the trader. The default value of the current quantity will be the number entered in the quantity description field, but it could be changed by adjusting the figure in the current quantity field 502.

An embodiment of the system also allows a trader to delete all of his working orders with a single click of either the right or left mouse button anywhere in the last traded quantity (LTQ) column 512 (this functionality can be provided in any general area of the screen as well or as an alternative). This allows a trader to exit the market immediately. An embodiment of the invention also allows a trader to delete all of his orders from the market at a particular price level. A click with either mouse button in the Executed/Working (E/W) column 514 will delete all working orders in the cell that was clicked. Thus, if a trader believes that previously sent orders at a particular price that have not been filled would be poor trades, the trader can delete these orders with a single click.

A process for placing trade orders using the display and trading method as described above is shown in the flowchart of FIG. 6. Prior to placing a trade order, the system provides preliminary fields for the input of data, such as the selection of a customer profile, the order quantity, and the maximum trade quantity. Once these preliminary fields are entered and the trader indicates the desire to place a trade order, the system will determine whether the trader performed the necessary actions to conduct a trade. For example, the invention will determine if the mouse pointer was positioned over a tradeable cell when the attempt to click trade was performed. If it is determined that a viable trade was requested, the system will create and send a limit order to the exchange at a quantity and price based on the preliminary settings and market prices. The system affords a trader the opportunity to change the order

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quantity preset buttons. The default quantities for these power buttons are 1, 5, 10, 20, 50, and 100. However, in this preferred embodiment the trader can alter any or all of these default quantities by performing a right click on each specific button and manually entering a different number quantity.

In step 600, the trader has the display on the trading terminal screen showing the market for a given commodity. In step 602, the parameters are set in the appropriate fields, such as the L and R fields and the Current Quantity, NetPos or Offset fields from the pull-down menu. In step 604, the mouse pointer is positioned and clicked over a cell in the display by the trader. In step 606, the system determines whether the cell clicked is a tradeable cell (i.e. in the AskQ column or BidQ column). If not, then in step 608, no trade order is created or sent and, rather, other quantities are adjusted or functions are performed based upon the cell selected. Otherwise, in step 610, the system determines whether it was the left or the right button of the mouse that was clicked. If it was the right, then in step 612, the system will use the quantity in the R field when it determines the total quantity of the order in step 614. If the left button was clicked, then in step 616, the system determines which quantity description was chosen: Offset, NetPos or an actual number.

If Offset was chosen, then the system, in step 618, will use the quantity in the L field when it determines the total quantity of the order in step 614. If NetPos was chosen, then the system, in step 620, will determine that the total quantity for the trade order will be the current NetPos value—the net position of the trader in the given commodity. If an actual number was used as the quantity description, then, in step 622, the system will determine that the total quantity for the trade order will be the current quantity entered. In step 614, the system will determine that the total quantity for the trade order will be the value of the R field (if step 612 was taken) or the value of the L field (if step 618 was taken), plus all quantities in the market for prices better than or equal to the price in the row clicked. This will add up the quantities for each order in the market that will fill the order being entered by the trader (plus the L or R value).

After either steps 614, 622 or 620, the system, in step 624, determines which column was clicked, BidQ or AskQ. If AskQ was clicked, then, in step 626, the system sends a sell limit order to the market at the price corresponding to the row for the total quantity as already determined. If BidQ was clicked, then, in step 628, the system sends a buy limit order to the market at the price corresponding to the row for the total quantity as already determined. The process described above is merely one embodiment and the present invention is not limited to this particular process or to any process.

One commercially available product that incorporates display screens of the type illustrated in FIGS. 2 and 3 is sold under the brand name X_TRADER® by Trading Technologies International, Inc., of Chicago, Ill. Display screens of the type illustrated in FIG. 3 are sometimes referred to herein as MD_TRADER™-style displays. As discussed above, however, the trading tools of the preferred embodiments can be used with virtually any electronic trading application, unless otherwise noted.

Given the foregoing information regarding graphical user interfaces for electronic trading and their use, a number of trading tools will now be described. One or more of these trading tools may be incorporated into a trading application, for example, to assist the trader and improve the efficiency and timeliness of trading.

Last Traded Quantity Marker

The "Last Traded Quantity Marker," in accordance with a preferred embodiment, provides an indication of the Last

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Traded Quantity (LTQ). In a display that includes dynamic market information that is associated with a static price scale, such as the MD_TRADER™-style display, the LTQ marker may move up and down the LTQ column as an associated LTQ price changes. One form of a LTQ marker **700** is shown in FIG. 7, where both a numerical value and a color or shading are used. For consecutive trades at the same price, the LTQ marker **700** may show, for example, either i) a cumulative quantity for all consecutive trades at the Last Traded Price, or ii) the quantity of only the most recent trade at the Last Traded Price. The accumulation of the total quantity for multiple LTQ occurrences is typically gateway (i.e. exchange) dependant. Most gateways, however, will accumulate the quantity. For gateways that do not accumulate the LTQ, a trading application, such as the application program interface illustrated in FIG. 1, may convert the LTQ into a cumulative indicator, if desired.

Generally, as long as a contract continues to trade at the same specific price, the LTQ will accumulate. When a contract trades at a new price, the marker may move beside that price and the quantity displayed inside the indicator box and will reflect the quantity of the last trade only. Should a contract trade at a price where a previous contract traded, the indicator will return to that price level, and the indicator box will again display the quantity of that last trade only (it will not add the newly traded quantity to the quantity that was displayed the last time the marker resided at this price). The indicator, located in the LTQ column **702**, does not simply display the number of the last traded quantity. Rather, the marker also, by residing next to the price (in the price column **704**) at which the last contract traded, indicates to the user the price at which that trade occurred. The LTQ marker **700** is preferably, but not necessarily, associated with the corresponding last traded price **706**. It is not necessary that numerical values for a price or quantity be associated with the marker.

In accordance with a preferred embodiment, therefore, the LTQ marker **700** is a visual indicator of the last traded quantity. Any type of marker may be used as long as it may be recognized by the user as an indicator of quantity. Other indicators, such as color or a graphical indicator, like a sliding scale, thermometer-type scale or speedometer-type scale, may alternatively be used as a marker. The graphical indicators may, but are not required to, include associated numerical values. In further alternatives, however, combinations of indicators may be used to illustrate characteristics of an item of interest, like the LTQ. For example, the quantity itself may be presented numerically or graphically, and color may be used with the quantity indicator to illustrate a trend, such as increasing or decreasing volume or rate of change in volume, or increasing or decreasing price associated with the LTQ. In addition, although described in the preceding few paragraphs as a marker for the LTQ, these types of markers may alternatively be used for any item in the user interface that may be of interest to the user.

In addition, when the user interface is configured to display a consolidated static price scale, for example as described below under the heading Consolidation Control Icon, the LTQ cell **708** may be subdivided into price consolidation increments and a LTQ marker may be shown, for example, as a horizontal line, within the corresponding subdivision of the LTQ cell **708**. The position of the graphical indicator, which in this example is a horizontal line, within the LTQ cell **708** provides a visual indication of the price within the consolidated range at which the last traded quantity changed hands.

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Color Coding of Markers

As noted above, items of interest in the user interface may be color coded or highlighted using color or gray scale shades. In a preferred embodiment, the user interface is of the type shown in FIG. 3 having market data associated with a static price scale, such as the MD_TRADER™ interface, and color is used with the LTQ marker to provide a visual distinction between, for example, an increase or decrease in the price value associated with the Last Traded Quantity (LTQ) from the price value associated with the previous LTQ. In MD_TRADER™, the LTQ may be presented as a highlighted cell in the LTQ column **702**, as shown in FIG. 7, which is displayed at a level that corresponds to the Last Traded Price (LTP) **706**. In a preferred embodiment, the highlighted cell changes colors based on the market's price movements. For example, a LTQ cell **710** may be displayed with a background that is one color, such as blue, when the change in price associated with the LTQ is an increase from the price associated with the previous LTQ **708**. Whereas a LTQ cell **712** may be displayed with a different colored background, such as red, when the change in price from the previous LTQ **708** decreases.

In addition, color may provide additional information about items of interest, like the LTQ. For example, when the commodity at issue has yet to have been traded during that current trading session, the LTQ column **702** may be shown in a particular color, such as gray, and may remain that color until a quantity has been filled. When a quantity has been filled, the cell displaying the first LTQ for that session may be highlighted in a particular color, such as green, signifying neither an up nor down tick from the previous LTQ. Subsequent fills will result in the LTQ cell being highlighted, for the preceding examples, in either a blue or a red color, unless the price level does not change from one trade to another, in which case the cell will remain green until there is a change in the price of the LTQ.

This benefits a trader in that the display of, and the color designation(s) for, the LTQ provides a visual reference of the market's price movements, status or trends, thereby permitting a trader to quickly absorb additional information, such as the direction of the market's activity. As a result of seeing the changes in the price of the last traded quantities, a trader can more easily determine market status and trends, thereby enhancing the likelihood of the trader entering orders and having those orders filled at desirable prices.

The color-coding of the LTQ appears as a colored cell (e.g., **700**, **708** and **710**) in the LTQ column **702** and corresponds to the price row of that traded quantity. By default in one preferred embodiment, the colored cell will appear in blue when the LTQ ticks upward in price from the previous LTQ, will appear in red for instances when the LTQ ticks downward in price from the previous LTQ, and will appear in green for instances when the price level remains the same from one trade to the next. While these preferred colors are the default settings in one embodiment, the trading application preferably allows a trader to change color designations in accordance with the trader's own preferences. In addition, while certain embodiments have been described with reference to color being applied to a cell, the invention is not limited to embodiments in which color is applied to a cell. For example, color may be applied to any graphical indicator, such as the horizontal line used as a LTQ marker in the preceding section, to illustrate a property of the item of interest.

Overlay of Different Price Feeds

In one embodiment, the trading application provides an "Overlay of Different Price Feeds." The trading application may be X_TRADER®, referenced above, or any other com-

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mercially available product adapted as described herein. In many instances a particular commodity is only traded at a particular exchange. In other instances, however, a commodity may be traded at multiple exchanges. This is one instance when a user may be interested in simultaneous information from different price feeds, i.e. feeds from different exchanges in regard to a particular commodity. As another example, Eurex offers both an inside market stream and a market depth stream. Generally, the inside market stream is faster than the market depth stream. In accordance with a preferred embodiment, the different streams, whether from a single exchange or multiple exchanges, are used by the trading application to populate and display information about the commodity in a trading window.

A number of exchanges offer multiple price streams, but these exchanges often supply only those feeds that are requested by the trader. Each trader may request, for example, a stream of all of the quantities currently available in the market for a specific commodity, known as market depth, or the trader may request to receive only the inside market prices, where the inside market is the highest buy price and the lowest sell price at which there is quantity available for that commodity. This is also known as the best buy and best sell prices. Many traders are focused on these best prices, and therefore do not desire a stream of a market's depth. Thus, several exchanges cater to user preferences by offering different price feeds, while also benefiting by saving on bandwidth for traders who wish to receive only an inside market stream.

When using the 'overlay' feature, the system preferably displays all of the information that it receives, and the display continuously updates the cells. By accepting, or having the ability to accept, multiple feeds or streams, the trader is provided with greater security in knowing that if one feed should become slower or unavailable, the other feed will continue to update market information.

FIGS. 8 and 9 show a network 800 for the transfer of data from an exchange 802 to the client terminal 804 via parallel feeds carrying a first and a second price packet 806 and 808, respectively, through a router 810 and a Gateway 812. The client terminal 804 is running a trading application, such as X_TRADER®, which presents data carried by the feeds to a user. When a disruption in one of the feeds, referred to as a "hiccup" or lost data, occurs in the network, as shown at 814 in FIG. 9, packets from the top feed are prevented from feeding into the trader's display. A disruption, as the term is used herein, is not limited to a situation in which data is permanently lost, but rather is used generically to also cover instances when data is corrupted, slow or otherwise delayed. Without an auxiliary feed in instances of lost data, the display would be void of prices, and opportunities for trading could be lost. Without an auxiliary feed in instances of slow or delayed data, trading decisions would be made based on out of date information.

Although illustrated as a disruption 814 occurring between the gateway 812 and the client terminal 804, the feed may be disrupted at any point from the exchange 802 to the client terminal 804. Because of the parallel feed, the display of current information is not interrupted, regardless of the cause of the disruption. Moreover, the parallel feed allows the user to take advantage of speed differences between two feeds and displays the best available information to the user. It should be noted that, although the streams are illustrated as originating from one exchange 802, the streams may alternatively originate at different exchanges. In addition, while two feeds are

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typically sufficient, the preferred embodiments are not so limited, and information from more than two feeds may be simultaneously displayed.

In one embodiment of the invention, the 'Overlay Different Price Feeds' can be enabled or disabled by adding or removing a check in a 'Use Inside Market Prices' box in the a Properties dialog box. Other techniques for enabling this feature may alternatively be used. Where multiple feeds are being monitored and displayed, the trading application may provide the user with options for deciding which feed's data will be displayed in instances where the data from the feeds is not the same. For example, in instances where the feeds originate at different exchanges, the user may choose to display the best prices from the different feeds. As a further example, where the feeds originate at the same exchange, information from the most recent packet may be displayed, regardless of which feed carried the last displayed packet. Other alternatives will be apparent upon reviewing the foregoing.

Display of Aggregated Working Quantities

Another preferred embodiment provides a trader with a display of the aggregated quantities being worked in the market for a trader's buy and sell orders. A trader's total working quantities represent the total unfilled quantities of all the orders that the trader currently has entered but have yet to be filled in the market. For example, the trading application may display the total working buy quantities and the total working sell quantities for the specific commodity being traded and for the specific trader who entered those quantities in the market. FIG. 10 shows, as an example, a display for a trader who has separate working sell quantities of 14, 13, and 1 (at 1000), and separate working buy quantities of 5, 1, 15, 3, and 1 (at 1002). While this example utilizes an MD_TRADER™-style trading interface, any type of trading interface may alternatively be used. The trading application calculates the sum of the trader's working sell quantities (14+13+1=28) and the sum of the trader's working buy quantities (5+1+15+3+1=25) and, in this example, displays the aggregated quantities in cells 1004. The aggregated working quantities may be displayed in any manner or location that is helpful to the user. In another variation of this embodiment, the user may click directly on either the aggregated buy or sell quantity display cells to delete the working quantities displayed in those cells.

The display of a trader's aggregated working quantities in cells 1004 benefits a trader in that it provides the total exposure from the trader's working quantities. Although the display is dynamic, in that order quantities are continuously updated as new orders are entered and others are filled, the display of quantities at different market prices is limited by the size of the display screen. Thus, it is possible for a trader to have working quantities of which the trader is not aware at prices that are not visible in the display window. The aggregated working quantities display helps to alleviate this drawback by showing a trader the cumulative total of the trader's buy and sell working quantity. If the display shows anything but a zero, the trader will know that the trader currently has an unfilled working quantity in the market.

In the preferred embodiment, the display of aggregated working quantities, as shown in cells 1004 in FIG. 10, is presented to the user in conjunction with buttons that may be actuated by the user. As noted above, the user may use an input device, such as a mouse, to click the buttons 1006, 1008, thereby deleting the working orders associated with the displayed aggregated working quantities. One button 1006 displays the aggregated buy working quantity. The other button 1008 displays the aggregated sell working quantity. The aggregated totals that appear on each button 1006, 1008 are

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calculated from the non-aggregated working quantities as displayed in a working quantities column **1010**, as shown in FIG. **10**. In both the working quantities column **1010** and the aggregated quantity buttons **1006**, **1008**, the buy quantity is highlighted, in a preferred embodiment in a color, such as blue, and the sell quantity is highlighted, in a preferred embodiment in a different color, such as red. The user preferably has the option of whether to display the aggregated quantity buttons via, for example in MD_TRADER™, the properties settings window. The quantity buttons appear by default for new sessions. Of course, aggregated working quantities may be displayed by any trading application, as an alternative to the type of display illustrated in FIG. **10**.

Dynamic Indicator

Another preferred embodiment provides the user with the ability to paste a dynamic indicator for display in relation to, for example, a static price scale. In one embodiment, a first dynamic indicator column is displayed adjacent to the bid quantity column, and a second dynamic indicator column is displayed adjacent to the ask quantity column. The dynamic indicator may be applied to a dynamic indicator column from a spreadsheet, such as Microsoft EXCEL, or other third party charting or analytical software, to furnish the user with a visual indicator of, for example, a specific price. The display screen may, for example, be an MD_TRADER™-style display generated by the X_TRADER® trading application, although other trading applications and trading interfaces may alternatively be used.

The dynamic indicator is preferably associated with market information. In a preferred embodiment, the dynamic indicator is associated with a price, although it may alternatively be associated with any other item of interest to the user. Color coding may be applied to the dynamic indicator.

When used, for example, with an MD_TRADER™-style display, a dynamic indicator may be associated with a specific price, as set by a trader using the third party software, and displayed in relation to a static price scale. If the dynamic indicator is associated with a price that is outside of the viewable area of the trader's display, it preferably becomes viewable on the screen when the associated price comes into view. Although a preferred embodiment of the invention involves copying and pasting to and from a spreadsheet, other methods of transferring information may also be used.

Use of this particular embodiment is initiated when a trader enters or pastes a value into a spreadsheet **1100**. For example, the value may be a specific price that the trader wants to monitor, or it may be a dynamic price that includes an attached calculation. The indicator is not limited to use with prices, but alternatively may be used for any item of interest on the trader's display. In the price example, once the value is entered in the spreadsheet, the trader copies the desired price cell(s) from the spreadsheet and pastes the cell(s) in one of the dynamic indicator columns **1102** of the screen, as shown in FIG. **11A**. Upon pasting the cell(s) in the dynamic indicator column, a display marker, also referred to as a dynamic indicator **1104**, highlights a cell in the indicator column **1102** that corresponds to the price calculated in the spreadsheet or other software.

The marker may be anything that is suitable to serve as an indicator for the trader, including, for example, graphical symbols and colors. Thus, although FIG. **11A** shows an entire highlighted cell **1104**, the marker may alternatively be color-based, such as a highlighted or colored foreground, background, border or portion of the cell. It is not necessary that the dynamic indicator occupy an entire cell. For example, in instances where the trading interface includes a static price scale, and the price scale is consolidated, it may be desirable

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to locate the dynamic indicator at a position within a cell that corresponds to a specific price. In addition, the marker may mark a range of prices. Preferably, the type of marker is selectable by the user.

Preferably, a link is established from the pasted cell to the spreadsheet **1100** from which the cell(s) was copied. The link gives the trader the ability to change the copied value in the spreadsheet **1100**, resulting in a related change in the pasted value in the dynamic indicator column **1102**. In one embodiment, this may be a two-way link between the trading interface and the third party software, or may link market data from the trading window, such as LTP or any other item of interest, into the spreadsheet or other third party software. Any suitable type of data exchange protocol may be used to embed information from the third party software or to link the dynamic indicator to the third party software. For example, Microsoft OLE 2.0 may be used to perform these functions when using Microsoft Windows applications as the third party software. In a preferred embodiment, Microsoft OLE is utilized to provide a link between a dynamic indicator and a cell from a Microsoft EXCEL spreadsheet. Data exchange protocols in general, and linking and embedding techniques in particular, are well known to those skilled in the art.

The meaning of the pasted dynamic indicator, and whether there is a dynamic calculation attached, is preferably at the decision of the individual trader. For example, the trader may want the dynamic indicator to represent a 'Fair Value Analysis' (average price). This would calculate the average price at which the specific commodity traded throughout the day. The trader would copy and paste the cell, with the attached calculation, into the dynamic display column. As the average price changed with each newly filled quantity, the dynamic indicator would move up or down the indicator column in conjunction with the appropriate price. When that indicator would move to a price viewable on the screen, the trader then could see a visual indicator of the 'Fair Value' price, and the trader could choose to enter quantity if the trader so desired. Although illustrated with reference to the 'Fair Value' price, it is to be appreciated that any calculation may alternatively be used.

As noted above, the dynamic indicator may also appear in only a portion of the cell. The dynamic indicator may be highlighted, for example, in a different color than the remainder of the cell or the surrounding cells, or may be displayed in time-alternating colors to create a flashing effect. The dynamic indicator may be presented as a highlighted or colored line within a cell. The portion of the cell in which the dynamic indicator appears may be selected to convey additional information, such as a price that falls between prices in a static price scale, for example when price consolidation is utilized. FIG. **11B** illustrates a dynamic indicator column **1102** in which a dynamic indicator is shown by highlighting only a portion of a cell **1110**.

The dynamic indicator benefits a trader in that the trader is provided, for example, with the ability to monitor price movements of the trader's own designation, whether those movements are of the last traded price, the 'Fair Value', or any other designated item of interest. By seeing the visible dynamic indicator associated with the trader's designated item of interest, the trader has a better opportunity to enter quantities at prices that are desirable. In addition, the trader can paste a dynamic indicator while continuing to enter other quantities throughout the trading session, and the indicator will continue to update as long as the session is open. Thus, the trader may find that a desirable price, as shown by the indicator, is available in the market long after the trader originally copied and pasted the indicator. Furthermore, the dynamic indicator may

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decrease the time it takes for the user to analyze market data by providing the user with a visual cue.

The display of the highlighted dynamic indicator, the color of which, in instances where color is used, may be selected by the trader through, for example, a properties window, appears in the buy and/or sell dynamic indicator columns on the display. The indicators can be moved to various locations on the display. Of course, more than one dynamic indicator may appear in any dynamic indicator column. In one embodiment that utilizes the MD_TRADER™-style display, the dynamic indicator columns appear by default to the immediate left and right of the buy and sell quantity columns, respectively, as shown in FIG. 11A. It is not necessary, however, that an entire column, row or other display element be devoted to display of a dynamic indicator. The dynamic indicator may alternatively be applied in the display on a cell-by-cell basis or may overlay other displayed information.

Out of Range Indicator

In accordance with a preferred embodiment, the graphical user interface for a trading application provides an indication that an item of interest is outside the viewable range of the display. The trading application may be X_TRADER®, referenced above, or any other commercially available product adapted as described in this section. Preferably, the out of range indicator also provides a user the ability to cause the display to shift up or down so that the user may view the item(s) of interest that lie outside of the viewable area. Examples of items of interest include, but are not limited to, the user's working orders and market depth information, such as quantities and prices.

In one embodiment, the out of range indicator is an arrow or similar pointing icon, which will indicate to the user that an item of interest lies outside the viewable area and further indicates the direction in which the viewable area needs to move to display the item of interest. Preferably, the viewable area will scroll or jump to the item of interest when the user clicks on or otherwise actuates the pointing icon. Each time the out of range indicator is used, the display may shift to the closest item of interest outside of the viewable area. As an alternative to jumping to the next item of interest, the display may shift row-by-row, column-by-column, price-by-price, or may jump to a new level based upon a selected item of interest.

For example, as shown in FIG. 12A, quantities are entered (and are viewable on the display) at sell prices of 109225, 109250, 109400, etc. If 109525 is the next highest price for which quantity is entered, but that quantity is beyond the viewable area, the trader can use an out of range quantity indicator, illustrated in this example as an 'up arrow' 1200 function, to shift the display up so that the quantity is viewable. Each ensuing use of the 'up arrow' 1200 function will result in the display of the next highest sell price for which quantity is entered in the market.

Continuing with this example, the same general principles apply when employing the 'down arrow' 1202 function. Specifically, in FIG. 12A, quantities are viewable on the trading screen at the buy prices of 108975, 108875, 108825, etc. If 108650 is the next lowest buy price for which quantity is entered in the market, then the trader could use the 'down arrow' 1202 function to display that quantity. Each ensuing use of the 'down arrow' 1202 function results in the display of the next lowest buy price for which quantity was entered in the market.

By using the out of range indicator (e.g., 1200, 1202), which in this example indicates out of range market quantities, the trader can essentially view the entire market depth provided by an exchange. The display of the entire market

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depth may be limited, for example, by the size of the user's display screen, or the user's preferences about the amount of market information that is displayed at any one time. Due to these constraints, it is possible that there may be items of interest, such as market depth or working orders, that the user cannot see. The out of range indicator not only alerts the user to the existence of an out of range item of interest, but also ensures that all such information is viewable via, for example, the 'up arrow' 1200 and 'down arrow' 1202 function.

When items of interest fall outside the viewable range, the trading application preferably generates cells, for example each with an arrow pointing up or down, as appropriate, at the top and/or bottom of the column related to the item of interest. The arrow cells are preferably enabled only when an item of interest, like a quantity entered in the market, falls outside of the viewable area. If no items of interest fall outside the viewable area, in one embodiment of the invention, the cells are inactive and may be presented on the display in a solid color without an arrow. As an alternative to the use of buttons with pointing icons, a preferred embodiment allows a user to scroll the market data in a desired direction using a mouse wheel or other user input device.

As noted above, the out of range indicator may alternatively, or in addition, be used to alert the user to out of range working orders. In this example, each time the indicator is used, the display preferably shifts to the user's next working order in the market that is outside of the viewable area. For example, as shown in FIG. 12B and evidenced by the working quantities present in the working quantities column, a trader has quantities entered (and viewable on the display) at sell or offer prices of 109200, 109250, and 109300. If 109550 is that trader's next highest price for which quantity is entered, but that quantity is beyond the viewable area, the trader can use the indicator, in this example an 'up offer arrow' 1204 function, to shift the display up so that the quantity is viewable. Each ensuing use of the 'up offer arrow' 1204 function results in the display of the trader's next highest offer price for which quantity is entered in the market. As stated above, the display alternatively may shift row-by-row, column-by-column, price-by-price, or may jump to a new level based upon a selected item of interest.

The same general principles may apply in regard to working buy orders, by employing a 'down bid arrow' 1206 function. For example, in FIG. 11B the trader has quantities entered and viewable on the trading screen at the buy or bid prices of 109025, 109000, 108975, 108875, and 108825. If 108650 is that trader's next lowest bid price for which quantity is entered in the market, then the trader could use the 'down bid arrow' 1206 function to display that quantity. Each ensuing use of the 'down bid arrow' 1206 function results in the display of that trader's next lowest bid price for which the trader has quantity entered in the market. Regardless of which arrow is being used, the screen will shift to quantities that the trader has entered in the market.

By using the out of range indicator (e.g., 1200, 1202, 1204 and 1206), the trader preferably may view information related to all of his or her working orders. This indicator reduces the potential for missed and forgotten opportunities or exposure by ensuring that all of the user's working orders are viewable via the 'up offer arrow', the 'up bid arrow', the 'down offer arrow' and 'down bid arrow' functions. The pointing icons, or arrow buttons, discussed above may be located at the top and/or bottom of any column of interest, or to the left and/or right side of any row of interest, that includes data that falls outside of the viewable range, including for example working orders that fall outside the viewable range. Other uses for the out of range indicator will be apparent to those skilled in the

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art upon reviewing this detailed description. Although described above with reference to pointing icons and/or arrow buttons, any type of indicator may alternatively be used as long as it is capable of indicating to the user that there is information outside of the viewable range.

'Thermometer' Indicator

In accordance with a preferred embodiment, the trading application provides a display to the user illustrating the volume of buy and sell quantities, in proportion to each other, in a logical, dynamic manner. The trading application may be X_TRADER®, referenced above, or any other commercially available product adapted as described in this section. In one embodiment, which is advantageously used in a trading application that displays price along a vertical axis, like X_TRADER®, the 'thermometer' indicator generates one or more narrow, vertical display columns **1300**, **1302** ('thermometers'), located in proximity to the quantity columns as shown in FIGS. **13A** & **13B**. The thermometers **1300**, **1302** may or may not be associated with a numeric display of the total number of buy and sell orders in the market for a particular commodity. When there is quantity available in the market, the thermometers **1300**, **1302** are preferably shaded in a manner that coincides with the percentage of buy versus sell quantities in the market. For example, if the buy and sell quantities in the market are equal, meaning that 50% of the quantity is buy quantity and 50% is sell quantity, then both thermometers **1300**, **1302** are shaded 50%, as shown in FIG. **13A**. In alternative embodiments, thermometer indicators may represent a relationship between any two items of interest to the user. Although vertical bars are shown in the illustrations, it should be understood that any visual indicator may, alternatively be used, as long as the indicator is capable of conveying the appropriate information to a user.

These thermometer columns are preferably adjustable in that the user may move the thermometer columns to various locations on the display as logic or user preference dictate. One preferred location, when the thermometer indicator is to represent the volume of buy quantities in relation to the volume of sell quantities, is immediately to the left of the buy quantity column and to the right of the sell quantity column. In this embodiment, the display of the thermometers may begin at the mid-point of the prices displayed on the screen. For example, in FIGS. **13A** and **13B**, the mid-point is between the prices of 90 and 85. The buy quantity thermometer descends from the mid-point to the lowest price displayed on the screen (**45**), and the sell quantity thermometer extends to the highest price displayed (**130**).

As noted above, the two thermometers show the quantity available in the market, with one thermometer each for the buy quantities and the sell quantities. In the illustrated embodiment, both thermometers extend from the mid-point price that is currently on the user's display. The buy thermometer preferably reaches to the lowest price displayed, while the sell thermometer preferably extends to the highest price displayed. The thermometer for the buy quantity descends from the top of the thermometer as the percentage of buy quantity increases. The thermometer for the sell quantity rises from the bottom of the thermometer as the percentage of sell quantity increases. If either the buy or sell quantity is larger than the other, the thermometers will reflect this difference based on the amount of the disparity. FIG. **13B**, for example, reflects a scenario where 95% of the quantity in the market is buy quantity and 5% of the quantity in the market is sell quantity. Therefore, the buy thermometer **1304** is shaded a great deal more than the sell thermometer **1306** to represent the disparity. Although described with reference to a thermometer indicator, any type of graphical indicator may alternatively

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natively be used to present the user with information about an item of interest. An alternative to displaying graphical indicators, like thermometers, is to display the market depth numerically, such as an aggregated sell quantity and an aggregated buy quantity, or as a percentage or ratio between buys and sells.

The thermometer indicator benefits a trader by showing the disparity of buy versus sell quantity in the market, thereby providing the trader with a tool to help decide whether to enter orders to buy or sell. For example, if there is a higher percentage of buy quantity in the market, then a greater number of the traders may want to buy, whereas if there is a greater percentage of sell quantity in the market, then a greater number of traders may want to sell. A trader can therefore deduce that with a greater percentage of buy quantity in the market, the trader may have a higher chance of having the trader's sell order filled at a desirable price if the trader were to enter such a sell order. If the percentage of sell quantity was higher in the market, the trader may have a greater chance of having the trader's buy order filled at a desirable price.

Auto Scalper

In accordance with another preferred embodiment, the trading application provides a way to automatically enter offsetting orders. The trading application preferably is X_TRADER®, using an MD_TRADER™-style display. Scalping is a term that is well known in the trading of commodities and it refers to a trading technique in which the trader trades for relatively smaller gains over a short period of time. In this embodiment, the trading application facilitates scalping by providing the user with an automatic order entry mechanism, embodiments of which are further described below. Preferably, automatic scalping is activated based on a user input, such as simultaneously pressing the control key and the scroll wheel on the user's mouse to manipulate a pair of indicator bars in the form of horizontal lines. Other actuating mechanisms may alternatively be used, including for example using a dialog box generated by the trading application or by actuating a scalping icon displayed on the user interface.

For this embodiment in which a mouse input is used to position parallel horizontal lines, the indicator bars define a price range where buy and sell quantities may be automatically entered when a similar such quantity is manually entered and filled. More specifically, this feature automatically enters sell quantities when a trader's manually entered buy quantity is filled. Likewise, this feature will automatically enter buy quantities when a trader's manually entered sell quantity is filled. The indicator bars move in relation to a static scale or axis representing prices. In a preferred embodiment, the indicator bars span the buy column, the sell column, and the price column, and they begin together at the mid-point of the prices displayed on the trader's display screen. In FIG. **14A**, that mid-point **1400** is between the prices of 90 and 85. When the trader enables this embodiment and scrolls the wheel on the trader's mouse up, the indicators move further apart, leaving a greater number of prices within the range of the indicator bars **1402**. When the trader scrolls the wheel down, the indicator bars move closer together (nearer to the mid-point), reducing the number of prices within the indicator columns, as shown in FIG. **14B**.

The order that is automatically entered is preferably for the same quantity as the trader's last buy or sell fill. Additionally, the order that is automatically entered is entered at a particular price or prices, depending on the preferences and/or practices of the trader, within the range of the indicator bars. In one embodiment, the order that is automatically entered is, in the case of a sell order, at the lowest price above the inside market

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within the range of the indicator bars, and in the case of a buy order, at the lowest price within the range of the indicator bars. Alternatively, the order that is automatically entered, may be at a price or prices calculated pursuant to any algorithm. For example, the quantity ordered may be evenly spread among the prices above (in the case of a sell order) or below (in the case of a buy order) the inside market and within the range of the indicator bars. The preferred embodiments are not limited to any particular technique for determining the price or prices at which the automatic order is entered. In a preferred embodiment, the user may set the rules for exactly how a duplicate order or orders are sent (whether at the best price or some other price).

For example and as shown in FIG. 14A, the indicator bars 1402 are set with the highest price at 110 and the lowest price at 65. The inside market, as indicated by the black line, is a buy price of 100 and a sell price of 105. If a trader using the automatic scalper enters quantity in the buy column and that quantity is filled, in one embodiment the system will automatically enter a duplicate quantity in the sell column at the lowest price above the inside market and within the range of the indicator bars, which in this example would be a sell price of 105.

A trader's position may be defined as the difference between the total quantity of the commodities bought and quantity of the commodities sold, and the trader is considered to have a long position when the quantity bought is greater than the quantity sold and a short position when the quantity sold is greater than the quantity bought. The more quantity the trader owns, the longer the trader's position will be. Conversely, the more quantity the trader sells, the shorter the trader's position will be. It may be desirable to have neither a long nor short position, referred to as a closed position, at the end of each day's trading session. If the buy quantity that the trader has entered in the market is filled, thus giving the trader a long position, the system, if actuated by the user, may automatically enter a duplicate sell quantity, which when filled will close the trader's position. Likewise, if the sell quantity that the trader has entered in the market is filled, the system may automatically enter a duplicate buy quantity, which when filled will close the trader's position. The automatic scalper automatically and, preferably, immediately enters a duplicate buy or sell quantity, which when filled will close the trader's position, preventing the trader from carrying a long or short position for an extended period of time.

In an alternative embodiment, the automatic scalper embodiment may be used to set one range, using, for example, indicator bars, for buying quantity and another range for selling quantity, at the same time. For this embodiment, the automatic scalper automatically quotes both sides (buy and sell) within the ranges determined by the user. In another alternative embodiment, multiple automatic scalping ranges, using different pairs of indicator bars, may be active in a single trading window. For this embodiment, the different ranges may be distinguished by using, for example, different colors for the different pairs of indicator bars.

Price Level Reasonability Check

In accordance with another preferred embodiment, the trading application provides a user with the ability, referred to as the Price Level Reasonability Check ("PLRC"), to prevent the entry of any order in the market at a price that is a specified number of ticks away from the Last Traded Price (LTP), or at a price that is a specified percentage different from the LTP. A tick can be anything, but is generally used in this detailed description as the minimum change in a price value that is set by the exchange for each commodity (e.g., \$0.01, \$0.05, \$0.10, or any other value). The trading application may be

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X-TRADER®, referenced above, or any other commercially available product adapted as described in this section. The PLRC may be enabled and configured by either a user, such as a trader or an administrator. For systems in which an administrator enables the PLRC, the PLRC may be applied uniformly to all client terminals on a network, or it may be adjusted on a case-by-case basis, thereby accounting, for example, for the experience level of the trader.

The PLRC may preferably be enabled on a commodity-by-commodity basis. For example, in FIG. 15A, a trader has entered a value of five to designate the maximum number of ticks from the LTP at which the trader is willing to enter an order in the market. As shown in FIG. 15B, the market for the commodity being traded has a tick value of five. Therefore, as dictated by the LTP of 90, the tick increment of five, and the PLRC value of five, should the trader choose to sell the commodity, the trader can enter an order at a price of 90, 85, 80, 75, 70, and/or 65. As shown in FIG. 15B, 90 is the last traded price, and the prices of 85, 80, 75, 70, and 65 are the sell prices that are less than or equal to five ticks away from that LTP. If the trader attempts to sell quantity at a price of 60 or below, the trader would be restricted from doing so because the price is beyond what the trader's PLRC value will allow. The same trader could buy the commodity at a price of 90, 95, 100, 105, 110, and/or 115. Each of these prices is within five ticks (the PLRC value) of the LTP. If a trader attempts to buy quantity at a price of 120 or higher, the trader would be restricted from doing so because the price is beyond what the trader's PLRC value will allow. The PLRC function may alternatively allow a trader or administrator to enter a percentage instead of a number of ticks to designate the maximum deviation from the LTP at which the user is allowed to enter orders in the market.

In an alternative embodiment, the trading application may provide a volatility adjusted PLRC function. In this embodiment, the PLRC dynamically increases or decreases the number of ticks (or percentage) away from the LTP within which a user may enter orders. The increase/decrease, which may be set by the user or a system administrator, is preferably based on volatility. For example, a trader may set the trading application to dynamically increase the PLRC by a specified amount if the volatility is greater than a specified amount.

The inclusion of the PLRC function limits the possibility of the trader having the working quantity filled at less desirable prices. The inside market is those prices, for which there is quantity available in the market, that are considered the best buy and sell prices available. The best buy price is the highest buy price that has quantity in the market, while the best sell price is lowest sell price that has quantity in the market. Generally, the LTP will be at or near to that inside market. The LTP is used as the center price from which the PLRC begins and allows quantity to be entered at a limited number of price levels either above or below that LTP level.

In one preferred embodiment, where the trading application is X-TRADER®, the PLRC is preferably enabled through the 'Options' display, an example of which is shown in FIG. 155B, by checking the "Price Level Reasonability Check" option box 1500 and then entering a value in the adjacent box 1502, designating the number of ticks that quantities can be filled beyond the last traded price value. Although the PLRC is described with reference to setting a boundary on acceptable prices for working quantities, the same technique may be used to constrain many other trading activities, such as the quantity associated with any order or to limit the total quantity being quoted by any individual user. Implementation of these variations is analogous to the implementation of

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PLRC described above and those skilled in the art can implement the variations based on this detailed description.

Group Positioning and Automatic Grid Positioning

In accordance with another preferred embodiment, the trading application may re-position any item of interest within the trading interface. In one embodiment, the trading application tracks the market's activity by automatically centering, for example, the inside market or the Last Traded Price ("LTP") on the display with respect to a static axis or scale of prices. Preferably, any other item of interest in the trading interface may serve as the basis for positioning information within the display.

The trading application preferably is X_TRADER®, using an MD_TRADER™-style display. In a preferred embodiment, the LTP is displayed in the LTP column and is indicated by a highlighted cell directly next to the price cell corresponding to the most recently filled quantity. The LTP cell preferably also contains an indication of the quantity of the most recent fill. The inside market is indicated by a line spanning both the buy and sell columns and is positioned between the highest buy price at which there is quantity currently in the market (the best buy price) and the lowest sell price at which there is quantity currently in the market (the best sell price).

Preferably, a user may designate any item of interest as the basis for the positioning function, such that, upon positioning, the item of interest will be moved to a predetermined location on the user's display. Automatic positioning may be triggered either by a timer, or by monitoring movement of the item(s) of interest about the display. Two items of interest to many traders are the inside market and the LTP. Thus, in one embodiment, the user may select one of these items for automatic re-positioning. When either the highlighted LTP cell or the inside market line is outside of the viewable area of a trader's display, or is more than a predetermined distance away from a location on the display, the LTP cell or the inside market line will automatically be placed at a predetermined location on the display. In a preferred embodiment, automatic positioning parameters may be selected by the user from the 'Options' display. The user may choose, for example, whether to re-position the display after a designated number of seconds, when the LTP is a designated number of cells from the top or bottom of the trader's display screen, or when the inside market is a designated number of cells from the top or bottom of the trader's display screen.

In addition, a trading application may present multiple trading windows to the user simultaneously. In accordance with a preferred embodiment, the automatic positioning tool may be applied globally to any number of open trading windows. Preferably, a dialog box or menu item may be used to enable the user to group or link, for purposes of re-positioning, any number of trading windows. In accordance with one embodiment, at least one of the linked trading windows becomes the master, and the other linked trading window(s) will be re-positioned whenever the master trading window is re-positioned. For example, one of the trading windows may be designated by the user as the master trading window by selecting "re-position all," or any similar designation, from a menu or dialog box. This may have the effect of re-positioning all open trading windows when the master trading window is re-positioned. The user may choose to have one or more trading windows ignore the re-positioning command by selecting "ignore," or any similar designation, from the menu or dialog box. This group re-positioning feature may be used in conjunction with the automatic re-positioning tool or with manual re-positioning (such as through the click of a center mouse button or the use of any input device). Other tech-

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niques for grouping trading windows will be apparent to those skilled in the art upon review of this detailed description.

In a preferred embodiment, the positioning tool serves to center the item of interest (such as the LTP or the inside market) on the display. As shown in FIG. 16A, the LTP is displayed in the LTP column **1602** and is indicated by a highlighted cell **1600** (the color of which maybe designated by the trader). This cell **1600** appears next to the price cell **1604** corresponding to the most recently filled quantity. The inside market is indicated by a solid line spanning both the buy **1608** and sell **1610** columns, and is between the highest buy price at which there is quantity currently in the market and the lowest sell price at which there is quantity currently in the market. FIG. 16B is a display showing how a trader may select and manipulate the automatic grid centering feature. Although presented in FIGS. 16A and 16B as being applied to a scrolling vertical scale, it should be understood that the preferred embodiments are not so limited. Rather, automatic positioning may be applied regardless of the direction of movement or the number of dimensions in which information is displayed.

As quantities are entered and filled in the market, the LTP and inside market change to indicate the price of the last filled quantity and the most recent best buy and sell prices. In a volatile market, a large number of quantities can be filled in a relatively short period of time, resulting in a continuous fluctuation of the LTP and inside market. The LTP and the inside market are two indicators that a trader may use to understand at what prices other traders find a commodity to be most desirable. A trader may use automatic positioning to always have a visual reference of where the market is trading, increasing the likelihood of entering quantities and having those quantities filled at desirable prices. In addition, automatic positioning may be used in conjunction with manual positioning. In other words, it is preferable that by enabling automatic positioning, the user is not thereby precluded from manually re-positioning the display.

Highlight Mid-Point of Last Re-Position

In accordance with a preferred embodiment, a trader may emphasize the mid-point of prices and/or quantities entered in the market at the time of the last re-position event. Preferably, a re-position event centers the display around the inside market, where the inside market is the highest buy price and the lowest sell price for the commodity being traded for which there is quantity in the market, or alternatively, a re-position event may center the display at any price and/or quantity, if so desired. Furthermore, a re-position event does not need to center on any particular price, but may ensure that a particular price, or other item of interest, is positioned at a predetermined location, or within a range of locations, on the display.

In the preferred embodiment, the mid-point is designated by a bold line that spans the columns of the display screen, or in another embodiment, the mid-point may be designated by a color, arrow, text, and so forth. Preferably, the exact location of the mid-point line is dependent on the number of the price rows that are displayed between the best buy and best offer price rows (at which quantity is available) at the time of the last re-center event. Alternatively, the location of the mid-point line may be dependent on the quantities of a portion, or all, of the buy and sell orders, or may be dependent on the combination of price and quantities of the portion or all of the buy and sell orders. In yet another alternative, a bold line representing a particular price level may be displayed in association with any item of interest to the user, to thereby adjust the content of the trading interface to the user's preferred range.

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Of course, markers other than a line may alternatively be used. For example, like many of the foregoing embodiments, the marker may be highlighting, a color or a graphical indicator disposed upon the display at the desired location. According to this embodiment, a trader may benefit from the visual representation of the discrepancy between the best bid and offer prices currently in the market.

According to the preferred embodiment, when the number of price rows between the best bid and best offer price rows (where quantity is entered) is an even number (or zero), the mid-point line is displayed between the middle values, with these being the highest buy (bid) price and the lowest sell (offer) price that are displayed in the window. For example, in FIG. 19A, the best bid price is 75 and the best offer price is 100. In this example, the display for the product is traded in ticks in increments of 5. As a result, the prices that are displayed between the best bid and best offer prices are 80, 85, 90 and 95. Because the total number of prices between the best bid and best offer is an even number, the mid-point line **1800** is displayed between the highest bid price of 85 and the lowest offer price of 90. Other methods may alternatively be used to determine the mid-point of an even number of rows, cells or columns.

In addition, according to the preferred embodiment, when the number of price rows between the best bid and the best offer prices (where quantity is entered) is an odd number, the mid-point line is displayed in the top of the cell that signifies the middle price value of the prices displayed between the best bid and best offer prices. For example, in FIG. 19B, the best bid price is 85, and the best offer price is 105. The display for the product being traded ticks in increments of 5. As a result, the prices that are displayed between the best bid and the best offer are 90, 95 and 100. Because the total number of prices between the best bid and best offer is an odd number, the mid-point line **1902** is displayed above the price row of 95 because 95 signifies the middle price value of the prices displayed between the best bid and best offer prices. It should be understood that the mid-point line **1902** may be displayed below or in the middle of the price row of 95 to indicate the middle price value. Other methods may alternatively be used to determine the mid-point of an odd number of rows, cells or columns.

While the preferred embodiment utilizes an MD_TRADER™-style display with a vertical static price axis or scale, this trading tool may be utilized with any display in which market information, such as bids, asks and/or working orders, are displayed relative to a static scale or axis of prices. It is not necessary that the scale or axis be vertical or even two-dimensional. Rather, the market information may be displayed horizontally, at an angle, n-dimensionally, or in any other fashion.

The display of the mid-point line may be enabled through an 'Options' display, an example of which is shown in FIG. 19C, by clicking the box **1906** directly to the left of the 'Highlight Midpoint of Last Re-center' option. Other techniques known to those skilled in the art, such as selecting this tool from a menu, may alternatively be used. Also, highlighting the mid-point may be applied to a variety of applications where the trader would like to highlight a midpoint that corresponds to prices and/or quantities, or any other item of interest.

Drag and Drop of Working Quantities

In accordance with another preferred embodiment, the trading application permits the trader to change the trader's working orders by dragging and dropping working quantities from one price level to another price level vis-à-vis a static price scale or axis. The trading application preferably is

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X_TRADER®, using an MD_TRADE™-style display. When using an MD_TRADER™-style display to drag and drop a working order, in one embodiment, the trader clicks on an active cell within the working quantity column. This activates the drag and drop feature and allows the trader to manipulate the cell by moving the cell on the trader's trading screen. Such a manipulation is commonly referred to as "dragging" the chosen data. Prior to releasing the mouse button, a trader drags the working order by moving the cursor to a new cell in the working quantity column. The trader then releases or "drops" the data in a new cell. In a preferred embodiment, the ability to drag and drop working orders as described herein is an option that may be turned on or off by the user for each individual trading window.

At the point the data is dropped, the previous quantity may be deleted from the original price and a new quantity entered at the price associated with the cell in which the new working quantity was dropped. The quantity displayed in either the buy or sell column that corresponds to the traders working quantity also moves to the newly selected price level when the drag and drop function is performed. Any approach may be used to change the user's working orders. For example, rather than resulting in the deletion of an existing working order and the entry of a new working order, a single cancel and replace, as known to those skilled in the art, may be used to change the user's working orders.

The ability to drag and drop working quantities, as displayed in the working quantities column, can be used by a trader who is not satisfied with the current price at which such quantity is entered in the market. The trader is given the capability of changing the price level at which the trader's quantity is entered without having to both delete and re-enter the quantity, resulting in a valuable time savings by simply dragging and dropping that quantity.

Preferably, the drag and drop feature makes it possible for a trader to move the entire working quantity of a single cell from one cell to another cell in the working quantity column when that quantity actually consists of multiple orders. For example, if a trader's working quantity is 30 at the price of 102.54 (**1700**), as shown in FIG. 17, that quantity may actually consist of three separate 10-lot orders, where a lot consists of multiple quantities that are traded together. Should the trader drag and drop that working quantity to the price of 102.57, the entire quantity of 30 (all three lots) will move cohesively to the new price level. Although the quantities were entered separately, once entered, they are treated as a cohesive whole.

The ability to drag and drop an entire quantity, regardless of the number of orders associated with that quantity, benefits a trader in that the trader does not need to constantly change the trader's quantity setting. The trader also does not have to repeat the drag and drop action for each order. For example, a trader may be trading at a quantity of 10, and therefore every time the trader enters a quantity in the market, the trader is entering a 10-lot order. If the trader wants to enter a quantity of 30, the trader can either change the quantity setting or click in the appropriate cell three times, thus entering three separate 10-lot orders in the market. Should the trader choose to drag and drop the working quantity from one price level to another, all of the working quantity associated with the cell and price level at which the drag and drop is performed will be moved to the new price level. As a result, the trader does not have to perform three separate drag and drop actions and valuable time can be saved, which could help to ensure that the quantities are entered and filled at their intended prices.

The display of a trader's working quantity appears in the working quantity column in a cell that corresponds to the

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price at which the quantity was entered. The display of the trader's working quantity remains visible on the trading screen until the quantity entered is completely filled, at which time the display of that specific working quantity will be removed from the working quantity column, or the order is canceled or deleted. In one embodiment of the invention, the cell in which the working quantity is displayed includes a 'W' followed by a value that indicates the quantity that is currently working in the market. The cell also contains a 'B' or an 'S' followed by a value that indicates how much of the original working Buy or Sell quantity has been bought or sold. Although described with reference to a working quantity column, the embodiments are not limited to trading interfaces that display working quantities in a column, but rather the teachings of this section may be applied to any type of display of working quantities.

In one preferred embodiment of drag and drop, nothing changes with respect to a user's pending working orders until the user releases the mouse button, keypad or other input device over the desired location on the trading interface. This feature allows the user to maintain his/her place in the trading queue for the earlier entered order. In an alternative embodiment, the new order is entered as soon as the mouse icon comes to rest in an appropriate area of the trading interface.

Another alternative embodiment allows drag and drop of working quantities when price consolidation is enabled. Any appropriate algorithm may be used to allocate the new order(s) over the consolidated price range. For this embodiment, the user preferably may select, such as through the use of a dialog box, the desired allocation algorithm. For example, all the "dropped" orders may be entered at one price, such as the price shown on the consolidated scale, or the working quantity may be equally distributed over the consolidation range associated with the location where the orders are dropped, or each working order may be moved by the increment on the consolidated price scale between their original location and the location at which the orders are dropped.

Yet another alternative provides a user with the ability to enable automatic modification of the quantity of the order entered at the location where the working order is dropped. For example, as noted above, working orders may remain working until the input device (e.g. mouse button) is released. In this case, a working order may be filled or partially filled during the drag and drop process. Preferably, the user may select, such as through a dialog box, what will happen to the "dropped" order in this situation. For example, if the working order is filled during drag and drop, the user may prefer that no new order be entered at the new price. Or, if the working quantity is partially filled, the user may prefer that only the remaining quantity be entered at the new price. In this manner, the "dropped" order may be automatically modified in accordance with user preference.

Average Price of Working Quantities

In accordance with a preferred embodiment, a display shows the average price for a trader's working buy and sell quantities that are entered in the market. A trader's working quantities represent the unfilled quantities of all the orders that the trader currently has entered, but not filled in the market. Preferably, the display shows the average price of the total working buy quantities and the average price of the total working sell quantities for the specific commodity being traded and for the specific trader who entered those quantities. For this embodiment, the average working prices may be displayed using, for example, highlighting, color, or a graphical indicator associated with a static price scale or axis, if such a scale or axis is displayed. The display may or may not include the actual numerical value of the average price.

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In an alternate embodiment, a distribution of the prices for the trader's working buy and/or sell quantities that are entered in the market is displayed. In this alternative embodiment, the average price might also be displayed in or around the displayed distribution of the prices. It should also be understood that the average price and/or the distribution of prices may be displayed in a text format, displayed in a color format (e.g., a color indicator), displayed in a graphical format (e.g., using text and color), and so on.

For example, FIG. 18 shows a screen for a trader who has two working buy quantities at the market price of 96, eight working buy quantities at a price of 95, and two working buy quantities at a price of 94 (**1800**). Preferably, the average price of those working buy quantities is calculated by dividing the total price of the working quantities from the sum of the quantities and that average will be displayed as described below. In the preferred embodiment, the average price of the working buy quantities is calculated as follows (although, the average price may be calculated using other known types of statistical and/or numerical analysis):

Total Price of Working Buy Quantities/Total Buy
Quantity=Average Price of Working Buy Quanti-
ties:

$$((2 \times 96) + (8 \times 95) + (2 \times 94)) / (2 + 8 + 2) = 95$$

$$(192 + 760 + 188) / 12 = 95$$

$$1140 / 12 = 95$$

Preferably, the same calculation is utilized to determine the average price of the working sell quantities. Using the illustration from the example above, FIG. 18 also shows a screen for a trader who has four separate working sell quantities at the market price of 101, two working sell quantities at a price of 100, and four working sell quantities at a price of 99 (**1802**). The average price of the working sell quantities are displayed as described herein and that price is calculated as follows:

Total Price of Working Sell Quantities/Total Sell
Quantity=Average Price of Working Sell Quanti-
ties:

$$((4 \times 101) + (2 \times 100) + (4 \times 99)) / (4 + 2 + 4) = 100$$

$$(404 + 200 + 396) / 10 = 100$$

$$3005 / 10 = 100$$

Preferably, the calculation of the average price of the working quantities is on a contract-to-contract basis, meaning that separate average prices are calculated and displayed for each separate commodity in which the trader has working quantity entered.

Preferably, the display of the average price and/or distribution of prices of a trader's working buy and sell quantities can be used to compare the trader's average price against all other current buy and sell quantities entered in the market for the commodity. This function can benefit a trader by helping to ensure that the trader is trading at the most desirable prices.

In the preferred embodiment, the display of the average price for a trader's working quantities appears as two separate cells within the display—one displaying the average buy price **1804** of the trader's working sell quantities and the other the average sell price **1806** of the trader's working buy quantities. In the preferred embodiment, the average buy price is displayed at the bottom of the working quantities column and the average sell price **1806** is displayed at the top of that column, as shown in FIG. 18. Moreover, in the preferred

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embodiment, the price in the average sell price cell is highlighted in red and the price in the average buy price cell is highlighted in blue. Although, it should be understood that the average sell price and the average buy price can be displayed anywhere on the screen, and the average sell price and average buy price may be displayed textually, in any color, both textually and in a color, and so forth.

Coding of Blank Spots

In accordance with a preferred embodiment, cells in the buy and sell columns of the display that correspond to prices at which there is no quantity entered in the market are visually distinguished from those cells at which such quantity is entered. The buy and sell price levels for which there is not corresponding quantities are designated as "blank spots" **2000**, and in the preferred embodiment appear in a different shade than populated cells as a means of providing a better visual representation of where the market is trading, as shown in FIG. **20A**. The blank spots **2000** may appear in a lighter shade or darker shade than populated cells, a different color, or a different texture such as hatching from those cells where there is quantity entered. Preferably, as new quantities are entered into the market, and existing quantities are filled and removed from the market, the blank spots **2000** change accordingly. In addition, it is preferable that the user be able to select the manner in which blank spots are displayed.

According to an embodiment, a trader may benefit in that the visual difference between buy and sell cells that contain quantity, verses those that do not contain quantity, makes it easier for the trader to quickly recognize whether quantities are available in the market at a particular price. Thus, a trader interested in buying quantity has an enhanced display of where such quantity is available, and a trader interested in selling quantity can more easily gauge where other traders are selling the commodity.

In the preferred embodiment, color coding may appear in the buy and sell columns of the display at price levels at which there is no quantity currently in the market. The buy and sell cells that correspond to these price levels appear in a visually different manner than those cells at which such quantity is entered. Color coding may be enabled through a "Color Code Blank Spots" field of an "Options" display, shown in FIG. **20B**, by checking the box **2002** immediately to the left of the blank spots option.

In another preferred embodiment, color coding and/or shading may be applied not only to cells without quantity, but also to cells in which the quantity falls below a threshold. Preferably, the threshold may be set by a user or an administrator. In addition, the user may set different thresholds either within one trading window or across multiple trading windows. When different threshold levels are utilized, it is preferable that each threshold value be assigned a distinct color so that the user may quickly recognize the meaning of the color coding.

Display of Net Price of Open Position

In accordance with a preferred embodiment, a trader is provided with a display of the net price of the working buy and sell orders. A visual indicator such as text, color, a combination of text and color, or a graphical indicator is used to highlight to the trader the net price of working buy and sell orders. The graphical indicator may take any form, including a line or even a colored pixel.

In one embodiment, it may be useful to display the net price open position, where a position is the difference between the number of orders bought (a long position) and the number of orders sold (a short position). A trader's position is open when the number of orders bought or sold is not equal. If these orders are equal, the trader's position is considered closed.

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When orders are traded on an exchange, it is possible for a trader to receive multiple fills, for multiple quantities, and at different price levels for the quantities that make up the trader's orders. This feature incorporates the price levels of these multiple fills to determine the net price at which the fills occurred. The trader can then use this net price to gauge whether trading out of a position would result in a realized gain, loss, or scratch (neither a gain nor a loss).

To determine the net price of a trader's open position, this embodiment divides the total price of the quantity that has been filled by the total number of orders either bought or sold (a.k.a. the trader's current position). For example, a trader who purchased 10 contracts of a commodity (4@ 99, 2@ 100, and 4@ 101) would have a long 10 position, meaning that the trader would need to sell 10 contracts in order to close the trader's position. The net price of the trader's filled quantity would be 100, and would be calculated as follows:

$$\frac{\text{Total price of Filled Quantity/Current Position}=\text{Net Price of the Open Position}}{}$$

$$(4@ 99+2@ 100+4@ 101)/10=100$$

$$(396+200=404)/10=100$$

$$(1000)/10=100$$

Based on the calculation above, the value of 100 is displayed as the trader's net price of the trader's open position. The net price can be displayed in one of several manners, which include, without limitation, a box **2100** around the net price's price level cell as shown in FIG. **21**, a separate column for the display of the net price, a box across the net price's price level, or a distinguishing color for the net price. If a particular trader has a long position as the result of buying quantity, any additional quantity that is bought will cause the net price of the trader's open position to be re-calculated. Preferably, should that trader sell quantity, the trader's position will change but the net price that is displayed will remain constant. Any additional buy quantity will subsequently change both the trader's position and the net price of that position, while all subsequent sell quantity will adjust the trader's position only, and will do so only until the position is closed. Should a trader begin a trading session with a short position as a result having the sell quantity(s) filled, all of the trader's subsequent sell quantity will change both the position and the net price of the trader's open position when such sell quantity is filled. Any buy quantity that has been filled will not change the net price, but will instead affect only the position and only until that position has been closed. As a result, it will be easier for a trader to gauge where (at what price) the trader needs to buy or sell when the net price of the trader's long position is only allowed to increase as the position increases and the net price of the short position is only allowed increase as the position becomes shorter.

A trader may benefit in that the visual representation of the net price of the trader's open position reduces or eliminates the need to mentally calculate such a price when, depending on the market's volatility, the price may change repeatedly. A trader who has had consecutive buy quantities filled will have a long position and will see a display signifying the net price of that long position. Any sell quantities that are filled will not be calculated into that net price. Likewise, a trader who has consecutive sell quantities filled will have a short position and will see a display signifying the net price of that short position. Any buy quantities that are filled will not be calculated into that net price. The trader benefits from such a feature in that the trader will always have a display of the net price of the trader's primary position (either of all of the trader's buy

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quantities or all of the trader's sell quantities), which will therefore provide the trader with a better indication of the price level at which the trader needs to buy or sell additional quantities to make a profit and close the position. Alternatively, the average price of the trader's open position may be calculated based upon both buy and sell orders filled.

The marker indicating the net price may be anything that is suitable to serve as an indicator for the trader, including, for example, graphical symbols, numbers and/or colors. Thus, although FIG. 21 shows a cell 2100 surrounded by a colored, shaded or highlighted box, the marker may alternatively be graphical, or numerically displayed elsewhere on the user interface. It is not necessary that the marker occupy an entire cell. For example, in instances where the trading interface includes a static price scale, and the price scale is consolidated, it may be desirable to locate the marker at a position within a cell that corresponds to a specific price. Preferably, the type of marker is selectable by the user.

Consolidation Control Icon

In accordance with a preferred embodiment, a trader may consolidate price information, or other useful information, by a control icon that is displayed to the user on the same interface that is used for trading. Consolidation of price information is described in U.S. patent application Ser. No. 09/971,087, incorporated above. In the embodiment described herein, the control icon is preferably presented to the user on the same screen that is used for trading, thereby allowing the user to maintain his or her view of the market information as the control icon is adjusted.

In a preferred embodiment, the control icon is a slide control 2200, shown in FIG. 22, which can be dragged from left-to-right or right-to-left, but in alternate embodiments may include a dial that can be turned in the clockwise or counter-clockwise direction or any other control icon that may be actuated through the graphical user interface of the trading application. According to the preferred embodiment where price information may be consolidated through the slide control 2200, when the slide control 2200 is dragged to the far left, the display presents numbers in a one-tick, or uncompressed, progression. Price information may also be displayed in another manner besides ticks (such as currency), depending on the manner in which each exchange provides the price information and user's preferences. As the slide control 2200 is moved to the right, the control consolidates the prices and any other associated values (e.g., bid/ask quantities, working orders, etc.), thereby displaying values that become progressively more consolidated the further the slide control 2200 is moved to the right, and resulting in the display of prices in multiples of ticks. Preferably, each increment of the control icon may be selected by the user, such as through a dialog box or any other means known to those skilled in the art.

Although described with reference to a vertical price scale that is subject to consolidation, the preferred embodiments are not limited to consolidating a price scale, nor are they limited to consolidating a vertical display element. Rather, any numerical sequence is subject to consolidation, regardless of its orientation or number of dimensions. The preferred embodiments allow user selectable consolidation through an icon presented on the user interface.

The consolidation of price information by adjusting a control icon benefits a trader in that it quickly allows for a greater number of prices and/or associated values such as bid/ask quantities and working orders to be displayed at any given time. Thus, a trader has a greater chance of not only seeing a majority, if not all, of the quantity entered at those prices, but

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the trader also has a greater spectrum of prices in which to enter the trader's own quantities.

Conclusion

It should be understood that the above description of the preferred embodiments, alternative embodiments, and specific examples are given by way of illustration and not limitation. For example, the features described herein could be incorporated into a variety of displays. Many changes and modifications within the scope of the present embodiments may be made without departing from the spirit thereof, and the present invention includes all such changes and modifications.

We claim:

1. A method for repositioning a static price axis on a graphical user interface for displaying market information of a commodity being traded at an electronic exchange, the method comprising:

receiving market information relating to a commodity from an electronic exchange via a computing device, the market information comprising an inside market with a current highest bid price and a current lowest ask price for the commodity;

displaying a first plurality of price levels along a static price axis on a graphical user interface of a display device associated with the computing device, where the first plurality of price levels range from a lowest value to a highest value along the static price axis;

in response to an input command received via an input device associated with the computing device, adjusting the first plurality price levels among a range of price levels to an adjusted plurality of price levels including the first plurality of price levels;

displaying a bid and ask display region on the graphical user interface, the bid and ask display region comprising a plurality of locations corresponding to the first plurality of price levels displayed along the static price axis, wherein each location corresponds to one of the first plurality of price levels, and wherein a number of the plurality of locations changes according to adjusting the first plurality of price levels;

displaying a first indicator representing a quantity associated with the current highest bid price at a first location in the plurality of locations of the bid and ask display region, wherein the first indicator ascends or descends the static price axis as changes in the current highest bid price occur as a result of each of the plurality of price levels along the static price axis not changing positions on the graphical user interface unless a reposition command is received;

displaying a second indicator representing a quantity associated with the current lowest ask price at a second location in the plurality of locations of the bid and ask display region, wherein the second indicator ascends or descends the static price axis as changes in the current lowest ask price occur as a result of each of the plurality of price levels along the static price axis not changing positions on the graphical user interface unless the reposition command is received;

receiving the reposition command to reposition the static price axis when a designated price is within a designated number of price levels from the lowest value or the highest value along the static price axis; and

responsive to receiving the reposition command, automatically repositioning the static price axis on the graphical user interface such that a current inside market price is displayed at a new desired location.

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2. The method of claim 1, further comprising the step of establishing that the designated price is based on a last trade price for the commodity.

3. The method of claim 1, further comprising the step of establishing that the designated price is based on an inside market price for the commodity.

4. The method of claim 1, further comprising the step of establishing a second designated price and automatically repositioning the static price axis on the graphical user interface to position the second designated price at a predetermined location in relation to the static price axis, wherein the current inside market price is displayed at the new location responsive to the step of automatically repositioning the static price axis.

5. The method of claim 4, wherein the second designated price is based on a last trade price for the commodity.

6. The method of claim 4, wherein the second designated price is based on an inside market price for the commodity.

7. The method of claim 1, further comprising receiving the reposition command to reposition the static price axis when the designated price is within the designated number of price levels above the lowest value.

8. The method of claim 1, further comprising receiving the reposition command to reposition the static price axis when the designated price falls below the lowest value displayed along the static price axis.

9. The method of claim 1, further comprising receiving the reposition command to reposition the static price axis when the designated price is within the designated number of price levels below the highest value.

10. The method of claim 1, further comprising receiving the reposition command to reposition the static price axis when the designated price falls above the highest value displayed along the static price axis.

11. The method of claim 1, further comprising receiving the reposition command to reposition the static price axis when the designated price is at the lowest value.

12. The method of claim 1, further comprising receiving the reposition command to reposition the static price axis when the designated price is at the highest value.

13. The method of claim 1, further comprising receiving a second reposition command to reposition the static price axis when a timer expires.

14. The method of claim 1, further comprising receiving a manual command from a user input device to reposition the static price.

15. The method of claim 1, wherein the new desired location is a location that displays the first and second indicators substantially centered between the lowest value and the highest value along the static price axis.

16. The method of claim 1, further comprising: displaying an order entry region comprising a plurality of locations for receiving commands to send trade orders, each location corresponding to a price level along the static price axis; and

in response to a selection of a particular location of the order entry region by a single action of a user input device, setting a plurality of parameters for a trade order relating to the commodity and sending the trade order to the electronic exchange.

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17. A computer readable medium having computer-readable instructions thereon, which when executed by a computer, cause the computer to perform a method comprising:

receiving market information relating to a commodity from an electronic exchange via a computing device, the market information comprising an inside market with a current highest bid price and a current lowest ask price for the commodity;

displaying a first plurality of price levels along a static price axis on a graphical user interface of an output device associated with the computing device, where the first plurality of price levels range from a lowest value to a highest value along the static price axis;

in response to an input command received via an input device associated with the computing device, adjusting the first plurality price levels among a range of price levels to an adjusted plurality of price levels;

displaying a bid and ask display region on the graphical user interface, the bid and ask display region comprising a plurality of locations corresponding to the first plurality of price levels displayed along the static price axis, wherein each location corresponds to one of the first plurality of price levels, and wherein a number of the plurality of locations changes according to adjusting the first plurality of price levels;

displaying a first indicator representing quantity associated with the current highest bid price at a first location in the plurality of locations of the bid and ask display region, wherein the first indicator ascends or descends the static price axis as changes in the current highest bid price occur as a result of each of the plurality of price levels along the static price axis not changing positions on the graphical user interface unless a reposition command is received;

displaying a second indicator representing quantity associated with the current lowest ask price at a second location in the plurality of locations of the bid and ask display region, wherein the second indicator ascends or descends the static price axis as changes in the current lowest ask price occur as a result of each of the plurality of price levels along the static price axis not changing positions on the graphical user interface unless the reposition command is received;

receiving the reposition command to reposition the static price axis when a designated price is within a designated number of price levels from the lowest value or the highest value along the static price axis; and

responsive to receiving the reposition command, automatically repositioning the static price axis on the graphical user interface such that a current inside market price is displayed at a new desired location.

18. The computer readable medium of claim 17, further comprising receiving a second reposition command to reposition the static price axis when a timer expires.

19. The computer readable medium of claim 17, further comprising receiving a manual command to reposition the static price.

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